The American Scholar

Vol. II October · 1933 No. 4

Sidney Lanier · Walt Whitman
Aubrey Starke

The Germans: Unhappy Philosophers in Politics
Reinhold Niebuhr

The Great American Adventure
Royal Meeker

The Turning in the Lane for Mechanism
Jay C. Knode

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THE AMERICAN SCHOLAR is published four times a year, January, March, May, and October, by The United Chapters of Phi Beta Kappa. The annual subscription is $2 (Canada, $2.25; foreign, $2.50). Editorial and business offices, 145 West 55th Street, New York, N. Y. Printing office, The Scribner Press, 311 West 43rd Street, New York, N. Y. Entered as second-class matter January 27, 1932, at the Post-Office at New York, N. Y., under the act of March 3, 1879. Printed in the United States of America.

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OCTOBER · 1933 VOLUME II · No. 4

The American Scholar

PHI BETA KAPPA, the college honor society founded in 1776 at the College of William and Mary in Virginia, and the precursor of all the Greek-letter societies in America, publishes THE AMERICAN SCHOLAR not only for members of ΦBK but for all who have general intellectual interests.

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"THE magazine in the United States is the best instrument that has yet been invented or developed or discovered for affecting public opinion in our democracy. It gives the only way in which serious men can continuously reach the whole reading public. No newspaper goes many hundred miles from home. Every newspaper is, therefore, dominantly local. Few newspapers live longer than a day or a few days at most. But the magazines reach practically the whole reading people, and the better of them have a life of at least a month, and many copies are preserved and read much longer. A serious man, therefore, is now put quickly within reach of everybody in the United States — everybody who reads. And this is not only a great fact, but it is a new fact in the world — that the magazine is of universal circulation." Page held that a great editorship is a great trusteeship.

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Friends of Men by Charles Franklin Thwing.

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Graduated from Harvard, 1925; Assistant in English, Harvard University '25–'27. Instructor in English, Northwestern University, until 1929 when he retired to write.

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Author of *Sidney Lanier:* A Biographical and Critical Study.

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Author of *Does Civilization Need Religion? Leaves from the Notebook of a Tamed Cynic;* editor of the *World Tomorrow;* contributing editor of the *Christian Century.*

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Author, various medical treatises including *Outline History of Ophthalmology* and 3000 articles in the *American Encyclopedia of Ophthalmology;* inventor of numerous eye, ear, nose, and throat instruments and of optical procedures.

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Chairman of the Department of Classical Philology, Connecticut College for Women; recently studied and travelled for fifteen months along the entire Mediterranean coast.

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Joint author, Australian edition of *Introduction to the Study of Social Problems;* recipient, 1910, Rhodes Scholarship for South Australia; lectured at Adelaide University on the Law of Wrongs.

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Author of *Orienting the Student in College;* formerly, Director of Admissions, Long Island University.

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Contributes to many magazines; as editor of the largest home and garden magazine in the country takes somewhat technical subjects, horticulture, architecture, family psychology, etc., and presents them to the lay public.

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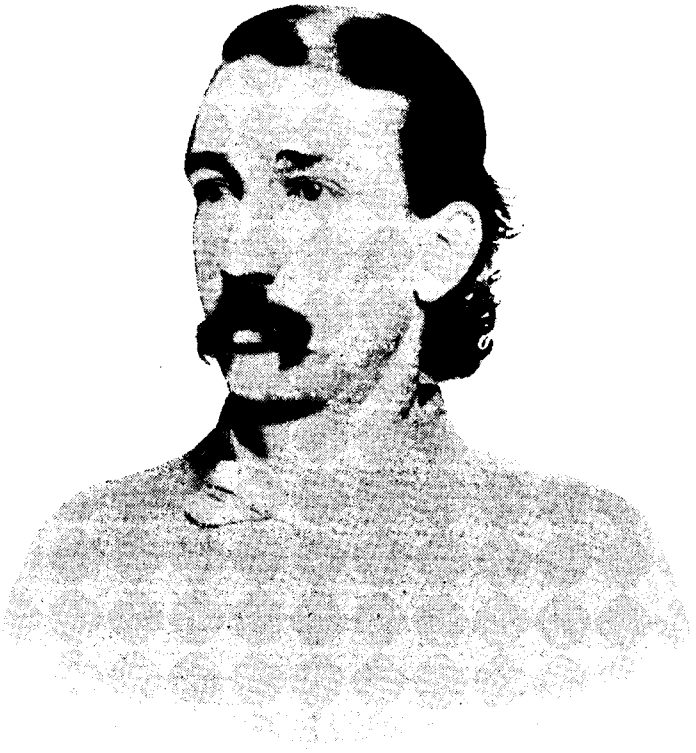

SIDNEY LANIER

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Sidney Lanier: Man of Science in the Field of Letters

AUBREY STARKE

TOWARD the end of February, 1865 Sidney Lanier with other Confederates was released from the Federal prison at Point Lookout, Maryland, and transported by boat to City Point, Virginia. For three days the cold was so intense that the ship was ice-bound and on one of those days Lanier, almost dead from exposure and lack of nourishment, was found in the hull of the ship by friends returning South from New York. With the permission of the officer in charge of the prisoners these friends had Lanier carried to their cabin where they gave him brandy and then hot soup and wrapped him in warm, clean blankets. He had regained some degree of strength when the boat docked, but the illness which was to send him at thirty-nine to the grave had taken possession of him. The hardships of the journey home, made chiefly on foot, caused a dangerous relapse from which Lanier was only beginning to recover when the Confederacy fell and Jefferson Davis was taken prisoner not far to the west of Lanier's home town of Macon, Georgia. "Then peace came," he wrote later, "and we looked about, over the blankest world you can imagine, for some employment." Lanier, born February 3, 1842, was at the time only a few months past his 23d birthday.

For the brave "footsore Confederate soldier" of Henry Grady's description the end of the war meant a return "from the trenches into the furrow," which he had left when he joined the army. For Lanier, a college tutor, but still a student, when the war broke out, there were no furrows to which he might return. His alma mater, Oglethorpe University, at Midway, Georgia, had been forced to close its doors. With tuberculosis well developed any sort of manual labor was impossible for him. But Lanier took what employment he was offered. There was a brief and unhappy experience as a tutor in a private family and then in January, 1866 Lanier became clerk and bookkeeper in his grandfather's hotel in Montgomery, Alabama.

But a man with Lanier's strength of character was not one to surrender readily his long cherished plans for a scholarly and literary ca-

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reer. Indeed, the apparent impossibility of such a career in the South in the period following the Civil War was a challenge that increased his resolution. He completed a novel begun during the war. He continued the study of German, of English literature, and of music, which the war had never wholly interrupted. And he ventured to send a few poems to *The Round Table*, a liberal New York weekly. For Lanier, from the time of the publication of these poems, the thought of failure in his attempt to make his mark as a man of letters was impossible.

In March, 1867, he gave up his job in the Exchange Hotel and went North in search of a publisher for his novel, *Tiger-Lilies*. When the novel was published, toward the end of 1867, Lanier felt so certain of his ability to succeed in spite of the handicap of ill-health and of the "mortal stagnation" of Reconstruction that had settled on the South that he dared to take unto himself a wife and in December, 1867 married Mary Day.

If anything within himself stood in the way of Lanier's success, it was not lack of gifts (he was extraordinarily gifted, both in poetry and in music), or lack of determination to succeed, or constitutional infirmity (which, with the optimism characteristic of the consumptive, he thought until the very end he would overcome), or liberality and breadth of outlook (for his broad point of view, his scientific attitude of impartial investigation, is noteworthy, and set him apart from other men of his section, and of his times). Rather it was his multiplicity of gifts and interests and his uncertainty concerning which he should make his vocation, which his avocation. At times music seemed to Lanier the most important thing in the world, "a gospel whereof the people are in great need," but at other times nothing seemed so exciting and important to him as the writing of poetry, or scholarly investigation; and never did Lanier lose interest in scientific research, in "Mineralogy, Botany, and Comparative Anatomy," or in the study of French and German.

To a Northern friend who reminded him, in the spring of 1868, of their pre-war dream of study in Germany, Lanier wrote: "I know few things I should like better than to go . . . but . . . it is like that I, who have loved Germany all my life, must, after all, die with only a dream of the childland." We know from his romantic novel that the conception of Germany which Lanier had formed as a result

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of much reading of Carlyle, Richter, and Novalis, and of long conversations with his friend Dr. James Woodrow, Professor of Natural Science at Oglethorpe, who had studied at Heidelberg, was of a land where scientists are musicians, and philosophers poets, and poets are professors, musicians, philosophers, and scientists.

Just before his marriage Lanier had made unsuccessful application for appointment to the Chair of Metaphysics in the University of Alabama and accepted in lieu of that the principalship of an academy at Prattville, Alabama. He also appeared often in concert, playing flute solos, and he made at this time his début as the composer of music. But ill-health—there were frequent hemorrhages—and the need of a larger income to support not merely a wife but a son caused Lanier to interrupt for a time his career as a teacher. In January, 1869 he began work in the law office, in Macon, of his father and maternal uncle.

His favorite rôle of philosopher and teacher he still essayed, however, at times, and he continued scholarly studies. In several public addresses and essays he challenged the South to forget the past, to let bygones be bygones, and to face the future with trust and courage. In a series of brief but notable poems—"The Tournament," "The Ship of Earth," "Nirvâna," "Life and Song," and especially "Barnacles" —he repeated the challenge and expressed his own acceptance of it. The poet's function, it seemed to Lanier, is ever a social function, his business "to keep the line of men touching shoulders with each other," and to convert learning into wisdom. Wisdom there is in these early addresses, poems, and essays, but also courage, as in his address (at the age of 27) to a group of graduates of a Georgia "female" college:

> Let us not forget . . . to accept and digest the unpalatable truth that we, here in the South, are among the crudest theorizers in the world. We put together too many unsubstantial hypotheses. . . . Let us learn to delay our conclusions until we have gathered together many facts, until we have taken all large and many-sided views, and above all, until we have actually tried them by material weights and measures. . . . Do not announce your projects before they are born; do not bury them before they are dead. Think, labor, *wait*.

For Lanier himself the years 1869–73 were largely a period of waiting, of the maturing of his projects and his talents. A series of dia-

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lect poems give evidence of the close touch he kept with practical affairs and the immediate needs of the South in the period of her greatest adversity. A group of essays, published and unpublished, prove that he was continuing his studies, his investigation of the arts —particularly the literature—of the past and seeking to draw from the past lessons for the future. But in these five years only six poems were published and only five prose pieces, addresses, or essays.

So again, as in the case of his application for the chair in the University of Alabama, one feels that it was not merely needs of the moment—the obligation to support a wife and two children—that kept Lanier studying and practising law in Macon through 1872, but an inner and deeper purpose. And one knows that it was not merely ill-health that led him to forsake the practice of law in 1873, after vain quests for health that carried him even to the Texas frontier. On November 29, 1873 he wrote to his father from Baltimore:

> My dear father, think how, for twenty years, through poverty, through pain, through weariness, through sickness . . . through all the discouragement of being wholly unacquainted with literary people and literary ways . . . [the] two figures of music and of poetry have steadily kept in my heart so I could not banish them. Does it not seem to you as to me, that I begin to have the right to enroll myself among the devotees of these two sublime arts, after having followed them so long and so humbly, and through so much bitterness?

One week later Lanier, "a raw player and a provincial withal, without practice, and guiltless of instruction—for I never had a teacher," made his début as first flutist with the Peabody Symphony Orchestra of Baltimore, directed by Asger Hamerik, and for the 8 remaining years of his life Lanier, when his health permitted, was a member of the Peabody Orchestra. Testimony concerning his great musical ability comes from such able musicians as Hamerik, Theodore Thomas, Leopold Damrosch, Clara Louise Kellogg, and Adelina Patti. His literary career, perhaps, was not so constantly interrupted by his career in music as his career in music was interrupted by his career in literature.

With the achievement of success as a musician and with the maturing of the artistic impulse in him Lanier once more sought expression in poetry, and in 1874 he wrote "My Springs," in honor of his wife. The poem, while beautiful and deservedly famous, represents

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an advance in ability of expression rather than in the mastery of form. In the summer of the same year, however, Lanier wrote "Corn," a poem of genuine originality in conception, expression, and form—in theme and treatment one of the most American of poems. Its publication in *Lippincott's Magazine* brought recognition, even fame, to Lanier as a poet but—what was better—the opportunity for acquaintance "with literary people and literary ways." Gibson Peacock, the cultivated and scholarly editor of the Philadelphia *Evening Bulletin*, introduced Lanier to Charlotte Cushman, through whom—on a visit to Miss Cushman in Boston—he met Longfellow and Lowell, and to Bayard Taylor—through whom Lanier met Stedman, Stoddard, Whitelaw Reid and other men of letters in New York.

It was not, however, the friendship of any one or two men of letters that Lanier needed but general recognition as a poet, and this he had achieved with "Corn." "Corn" was hardly in print before he had composed and sold "The Symphony," a courageous indictment of capitalistic industrialism, the most significant of all Lanier's poems, and had begun a series of able sonnets in which he sometimes achieved notable echoes of Shakespearean clearness and Miltonic vigor. This recognition brought him, through the mediation of Taylor, the invitation to write the text for Dudley Buck's cantata, to be performed at the opening exercises of the Philadelphia Centennial Exposition, and also the request to write a centennial ode for *Lippincott's*.

From "Corn," "The Symphony," and his centennial ode, "The Psalm of the West" (all included in his first and only volume of poems), even without the later and more famous "Marshes of Glynn" and "Sunrise," we may determine the relationship of poetry and music in the art of Lanier. He made no attempt to transform poetry into a branch of music, for he was never so absurd as to try to divorce sound wholly from meaning, but he did try to produce poetry that should be truly musical and not merely melodic or harmonic. There is in his best poetry, as Professor Norman Foerster has said of the Marsh Hymns, "not one melody artfully varied, but a bewildering succession of winding and darting melodies . . . a full, rich, complex background of sound, of crescendo and decrescendo restlessly alternating . . . a rapid tempo bespeaking eagerness and wonder, relieved perhaps too rarely by a brief tranquil interlude."

Ill-health prevented Lanier from taking the place offered him in

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Thomas's orchestra in the fall of 1876 and sent him, in December, to Florida. From Florida he returned the next spring more than ever eager to put down on paper the poems with which his heart was as full (he said) as a schoolboy's pocket, but apparently more keenly than before aware of his obligations as a husband and father of boys—who now numbered three (a fourth was born in August, 1880). Ill-health prevented his earning the living he formerly had from music; poetry paid none too well; only a few prose pot-boilers were accepted; the academic appointment for which he longed—as lecturer on music or on poetry, or as university fellow—was not forthcoming; efforts to secure a government clerkship proved futile. A friend in Baltimore in compassion arranged for Lanier to lecture in her parlor to a class of men and women on Elizabethan poetry.

The lectures, begun in March, 1878, probably lasted through April. Like recognition and success in anything else he undertook, the success of these lectures increased Lanier's interest in his subject to a degree that was all absorbing. More importantly, for his welfare and for his ultimate achievement of the goal that had long been his, they gave him a reputation in Baltimore and established his influence there. Daniel Coit Gilman, president of the newly opened Johns Hopkins University, who had tried before to secure an appointment for Lanier as fellow at Johns Hopkins, was now able to perform a greater service for Lanier, and planned a course of lectures on Shakespeare for the Peabody Institute of Baltimore, 24 lectures on the text of his plays to be given by Lanier and 14 on the background of the plays to be given by Basil Gildersleeve, H. B. Adams, and other Johns Hopkins men.

This course Lanier began on November 2, 1878. The lectures by the other lecturers were never given and long before Lanier's own lectures were over there came a letter from Gilman announcing his appointment, by the trustees, as Lecturer in English at Johns Hopkins, with the suggestion that the Peabody Institute lectures be repeated as his first university course. To provide himself and his Peabody Institute class with a satisfactory textbook of matter supplementary to the plays of Shakespeare (and in 1878 not easily obtainable, as now), Lanier had attempted to find a publisher for a two-volume work to be called "The English Sonneteers, from Surrey to Shakespere," consisting of poems and biographical sketches. Now, in preparation for the Johns Hopkins course and unable to find any satisfac-

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tory treatise on the subject, Lanier went into the Virginia mountains and wrote *The Science of English Verse*, an introduction to the study of poetry. In the preface Lanier made a rapid survey of the history of prosody, singling out John Wallis's *Grammatica Linguæ Anglicanæ* (1653) for praise because the introductory section is "an essay upon sound, the real clew to the whole labyrinth of verse." Verse Lanier defined, as he would have defined music, as "a set of specially related sounds." "The study of verse must begin with the study of sounds"—with reference to duration, intensity, pitch, and tone-color (*timbre*). Rhythm he found to depend primarily on duration, and this conclusion led him to the statement that "rhythm of any sort is impossible, except through the co-ordination of time" and to the definition, which has become famous, that "time is the essential basis of rhythm." He examined all aspects of verse, not merely rhythm but rhyme, alliteration, syzygy, and stanzaic forms. He scanned typical lines from the Anglo-Saxon, from Chaucer, Shakespeare, and poets contemporary with himself, using musical notes and symbols instead of the more familiar long and short accentual marks, in accordance with his basal proposition that time and not accent is fundamental in English meter; not to enable his readers—his students—to produce poetry or verse or even rhymed lines but rather to enable them to understand verse in general, and Shakespeare's in particular, and Shakespeare's mastery of form, and his development as an artist.

Writing to a friend Lanier protested the way in which critics received his treatise. As well accept Huxley's treatise on the crayfish "as a cookery-book containing new and ingenious methods of preparing shellfish for the table" as take his treatise as a set of laws for the verse-maker, he exclaimed. There is an art of poetry, he admitted, that *might* be taught, but he was not attempting to teach it. He had even gone so far as to assert: "For the artist in verse there is no law; the perception and love of beauty constitute the whole outfit; and what is herein set forth is to be taken merely as enlarging that perception and exalting that love."

With Lanier's own clear statements long since published, with the evidence of the book itself and the supplementary evidence of the lectures on Shakespeare available in almost every library, it is strange that critics should continue to refer to Lanier's exposition of poetic technique as something that interfered with his own poetry,

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as theories that fettered his imagination and distorted the music of his verse. Had he never given poetic technique a thought, Lanier would have written as he did. Inherited ability in the two arts rather than the study of the poetry of the past determined the character of the verse he wrote. Though he had, from college days, been a close student of literature, his scholarly investigation of Elizabethan and pre-Shakespearean poetry dates from the summer of 1876; his treatise on prosody was written in the summer of 1879; yet there is no essential difference between the poems published before July, 1876, and "The Marshes of Glynn," written in the fall of 1878, and "Sunrise," Lanier's testament and his farewell, written in December, 1880. What difference there is lies in greater felicity of expression, finer quality of music, increased nobility of conception—and such things, though they may come from study, are neither learned nor taught.

More profitable than speculation concerning the effect of Lanier's knowledge of the science of poetry on his own verse is a study of the general conclusions to which his research led. For Lanier's examination of verse, his scientific analysis of literature, suggested to him truths of larger implication than literary laws. He used the knowledge of poetry obtained from a detailed analysis of it better to understand Shakespeare's poetry and plays, and he used Shakespeare's plays to reveal Shakespeare's growth as an artist and his growth in character as a man. From the revelation of Shakespeare's artistic and moral growth he deduced truths about man in general, and his changing, increasingly enlightened relations to nature, the supernatural, and his fellow-man. He deduced also a moral law of attraction and repulsion, of antagonism or—to call it by the term he himself used in one of his best poems, which is an exposition of the law—"Opposition." In a final message to his class, in the last of the lectures published as *Shakspere and His Forerunners*, Lanier moralized:

> Surely the genius which in the heat and struggle of ideal creation has the enormous control and temperance to arrange and adjust in harmonious proportions all these esthetic antagonisms of verse, surely that is the same genius which in the heat and battle of life will arrange the moral antagonisms with similar self-control and temperance.

Qualities that Lanier revealed in these first lectures at Johns Hopkins (delivered between October 28 and December 19, 1879) he re-

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vealed also in the expository readings from Chaucer and Shakespeare which he gave for a class of University men in February and March, 1880, calling the course "The Study of the Art of Expression." We find the same qualities in his poetry, and in the spirited introductions to the books he edited for boys, the *Boy's Froissart*, *King Arthur*, *Mabinogion*, and *Percy*. These he prepared as hack-work, primarily, but they, quite as much as the university text-books he never was able to publish, prove Lanier to have been a true scholar, with a thorough knowledge of the bibliography of his subject, the utmost respect for the text on which he was working, and the keenest sense of the obligation of the editor to the reader. We find these qualities revealed more notably in his third course of lectures, delivered at Johns Hopkins between January 26 and April 13, 1881, designed as an investigation of English prose, though published (posthumously) under the title of *The English Novel*. The final sentence of the last lecture is: ". . . I find all the numerous threads of thought [presented in these lectures] gathered into one, if I say that George Eliot shows man what he may be, in terms of what he is," but the best summary of his course Lanier had made earlier. To Frances Willard, who spoke to him at the conclusion of one of the lectures about a "mission" she was to undertake among the negroes of the South, Lanier said: "We are all striving for one end, and that is to develop and ennoble the humanity of which we form a part." In that sentence he stated the final end of all his thinking, concerning literature, science, and music.

Other lectures it was not allowed to Lanier to give. It seemed to Mrs. Lanier that a miracle had been performed to give him strength to complete these lectures, even in an abridged form. A retreat into the mountains of North Carolina after a disastrous visit to New York could not restore the constitution impaired during the war, of which he had been recklessly unmindful when music, or poetry, or the service of his fellow man demanded his allegiance. Some hack work he completed there, some poems he wrote in curious (for Lanier) Whitmanesque form, some scientific investigations he made. The last weeks of that summer of 1881 were spent in preparation for the death which seemed no stranger. He died September 7, 1881.

One final revelation of himself as a scholarly man Lanier made in his request that an autopsy be performed, to determine, if possible, the cause of the malady so many physicians had been unable to cure.

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Lanier's Appreciation of Whitman

AUBREY STARKE

WHAT one poet thinks of another is of more than casual interest when the poets are contemporaries and the poetry of each differs less from that of the other than from the great body of poetry contemporaneously produced. And when, as in the case of Sidney Lanier and Walt Whitman, the one is variously reported to have admired and scorned the other, and partisans of each have vigorously asserted that there could be little in common between the two, it becomes something of a duty to lovers of truth to recover the defence one made of the other. Lanier's criticism of Walt Whitman is, we shall find, one of the clearest and most just yet made, his defence of Whitman one of the bravest and boldest. And the story of that defence reveals new evidence concerning the bigness and bravery of the American spirit.

The story of Lanier's appreciation of Whitman begins naturally enough with an account of his discovery of *Leaves of Grass*. Late in January, 1878, in New York, Lanier, calling on his friend Bayard Taylor, borrowed three books, none of them recently published but all new to Lanier: Whitman's *Leaves of Grass*, Lowell's *Among My Books*, and Swinburne's *Atalanta in Calydon*. On Sunday, January 27, he remained all day in his hotel room, suffering from what he himself optimistically called a cold, and read through the three volumes.

A week later in Baltimore, in thanking Taylor, Lanier wrote:

> Upon a sober comparison, I think Walt Whitman's "Leaves of Grass" worth at least a million of "Among My Books" and "Atlanta (*sic*) in Calydon." In the two latter I could not find anything which has not been much better said before; but "Leaves of Grass" was a real refreshment to me—like rude salt spray in your face—in spite of its enormous fundamental error that a thing is good because it is natural, and in spite of the world-wide difference between my own conceptions of art and its author's.

Comparisons reflected upon for a week are likely to be sober, even if they seem exaggerated, and Lanier's praise of Whitman's poetry was something more than the first excited report of the discovery of a new poet and of new poetry.

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That Lanier wanted then and there to purchase a copy of the book that had given him so much pleasure we may be quite sure, but money was pitifully scarce in February, 1878, in the Lanier household. The purchase of a five-dollar book was a matter to be long deliberated. But three months later, on the fifth of May, 1878, Lanier addressed to Whitman, from whom alone the then latest edition of *Leaves of Grass* was obtainable, the following letter:

My dear Sir:

A short time ago while on a visit to New York I happened one evening to find your *Leaves of Grass* in Mr. Bayard Taylor's library; and taking it with me to my room at the hotel I spent a night of glory and delight upon it. How it happened that I had never read this book before . . . is a story not worth the telling; but, in sending the enclosed bill to purchase a copy (which please mail to the above address) I cannot resist the temptation to tender you also my grateful thanks for such large and substantial thoughts uttered in a time when there are, as you say in another connection, so many "little plentiful mannikins skipping about in collars and tailed coats." Although I entirely disagree with you in all points connected with artistic form, and in so much of the outcome of your doctrine as is involved in those poetic exposures of the person which your pages unreservedly make, yet I feel sure that I understand you therein, and my dissent in these particulars becomes a very insignificant consideration in the presence of the unbounded delight which I take in the bigness and bravery of all your ways and thoughts. It is not known to me where I can find another modern song at once so large and so naive: and the time needs to be told few things so much as the absolute personality of the person, the sufficiency of the man's manhood *to* the man, which you have propounded in such strong and beautiful rhythms. I beg you to count me among your most earnest lovers, and to believe that it would make me very happy to be of the least humble service to you at any time.

SIDNEY LANIER.

How Whitman in one of the bitterest periods of his life received this letter we can only guess, but knowing Whitman and knowing what praise meant to him and how much misunderstanding of his poetic purpose and his poetry he had encountered, we must guess that he read the letter with joy akin to that Lanier had experienced in reading for the first time *Leaves of Grass*. There is some evidence for believing that a number of letters were exchanged between Whitman and Lanier, but none other has been published.

But Lanier's admiration for Whitman—the admiration of one

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truly liberal soul for another in whom he recognized kinship—persisted, whether there was correspondence or not. The line from Whitman quoted in the letter, "little plentiful mannikins skipping about in collars and tailed coats," Lanier quoted again with glee in the lectures on Shakespeare a turn of fortune soon made it possible for him to deliver in Baltimore. Contrasting the flippancy of the contemporary young man of fashion with the courtliness of the Elizabethan gentleman, he quoted Whitman's denunciation of the former. And in his last series of lectures, called erroneously "The English Novel" but planned by Lanier as a study of the development of personality from Æschylus to George Eliot—from ancient to modern times—he went to some pains to defend Whitman from charges made against him. It is with that defence, made, we should remember, at a time when and from a place where (an academic rostrum!) it required courage to defend Whitman, and with the publication of it that we are here most concerned.

Lanier died September 7, 1881, at the age of thirty-nine, of tuberculosis contracted during the Civil War. During his harassed literary career of fourteen years he had published a novel, a book of poems, a guide-book to Florida, a treatise on the science of verse, and two books edited by him for boys. At his death the greater number of his published poems remained uncollected, none of his numerous magazine essays had been reprinted, and several sets of lectures and many poems as well as two other books for boys and a number of essays were still in manuscript.

The circumstances and the untimeliness of Lanier's death stimulated an interest in his work that had been laggard. His poems began to appear in the magazines with greater frequency than before; the two books for boys left in manuscript were issued; and it was decided to publish his last course of Johns Hopkins lectures. The lectures appeared in the spring of 1883 under the title of *The English Novel and the Principle of its Development*, with only a "Prefatory Note" signed W. H. B. to suggest the work of an editor—and that ambiguous enough. "Had Mr. Lanier lived to prepare them for the press," wrote W. H. B., "he would probably have recast [these lectures] to some extent; but the present editor has not felt free to make any changes from the original manuscript, beyond the omission of a

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few local and occasional allusions, and the curtailment of several long extracts from well-known writers."

W. H. B. was William Hand Browne, some fourteen years older than Lanier but a devoted friend and a fellow flute-player. Browne was an able and a scholarly man, professor of English and librarian at Johns Hopkins, editor and secretary of the Maryland Historical Society. But Browne's treatment of Lanier's manuscript is not to his credit. The "few local and occasional allusions" he confessed to omitting were, we shall find, only friendly allusions to Whitman (numerous apparently unfriendly allusions being allowed to remain) and a notable tribute to the Jew.

That she was far from satisfied with the text as censored by Browne and published by Scribner's, Lanier's widow—her husband's "only companion" in the preparation of the lectures—soon asserted. In a letter published in *The Nation* of August 30, 1883, Mrs. Lanier explained that she had been too ill to do any work on the manuscript of the lectures or the proofs of the book, but that "upon mature reflection" she felt that "one paragraph omitted from page 44 ought to be included in the second lecture . . . because without it a complete expression of Mr. Lanier's views upon [Whitman and his poetry] would be wanting." Browne's omission of the paragraph she explained by revealing his apprehension that "false interpretation might have been given the passage." And Mrs. Lanier went on to say that publication of the paragraph with her letter was contrary to Browne's advice but "with his kind sanction, and with his sympathy as regards my own sense of duty in the matter." "Sense of duty in the matter"! Mrs. Lanier felt as keenly as her husband had the necessity for accuracy in scholarship, boldness in criticism, and for honesty and courage.

The paragraph Browne had omitted, which Mrs. Lanier then published, reads:

> Here let me first carefully disclaim and condemn all that flippant and sneering tone which dominates so many discussions of Whitman. While I differ from him utterly as to every principle of artistic procedure; while he seems to me the most stupendously mistaken man in all history as to what constitutes true democracy, and the true advance of art and man; while I am immeasurably shocked at the sweeping invasions of those reserves which depend on the very personality I have so much insisted upon, and which the whole consensus of the ages has considered more and more sacred with every year of growth in

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delicacy; yet, after all these prodigious allowances, I owe some keen delights to a certain combination of bigness and naïvety which make some of Whitman's passages so strong and taking, and indeed, on the one occasion when Whitman has abandoned his theory of formlessness and written in form he has made *My Captain, O my Captain* surely one of the most tender and beautiful poems in any language.

But Mrs. Lanier's objection to the altogether false tone given Lanier's discussion of Whitman and his poetry by the omission of this paragraph and similar friendly references passed unheeded. The next year Lanier's poems were collected and issued by Scribner's with a memorial by Dr. William Hayes Ward, editor of *The Independent*, who wrote of Lanier's emphasis on spiritual values: "This standard he would not forget in his judgment of artists. There was something in Whitman which 'refreshed him like harsh salt spray,' but to Whitman's lawlessness of art he was foe. He wrote in his notes:

> Whitman is poetry's butcher. Huge raw collops slashed from the rump of poetry, and never mind gristle—is what Whitman feeds our souls with.
>
> As nearly as I can make it out, Whitman's argument seems to be, that, because a prairie is wide, therefore debauchery is admirable, and because the Mississippi is long, therefore every American is God."

We have Whitman's own words—reported by Horace Traubel—as evidence that his "adverse reference" to him was also objected to by Mrs. Lanier, and "on the ground of its unfairness, not only to [Whitman] but to Lanier, since other things said by Lanier about [him], reflecting a more favorable mood, should also have been given."

Still, we can easily understand how Whitman, accustomed to the apostasy of his admirers and defenders, hearing of—perhaps actually reading—this adverse reference and the derogatory references in the 1883 edition of *The English Novel*, and remembering Lanier's own enthusiastic letter of May 5, 1878, should have smiled cynically when he spoke about Lanier. We can understand why, when young William Roscoe Thayer asked Whitman about his correspondence with Lanier, Whitman called Lanier's first letter to him "a florid, gushing letter"; and why, when he told Traubel about it later, and spoke of Mrs. Lanier's objection to the adverse reference in the memorial volume, he said: "I know nothing about that myself and care less." It was one way of hitting back at Lanier, of squaring accounts —an unsatisfactory way, but a way to be forgiven an old man.

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It was because of the unfriendly tone of Lanier's allusions to Whitman as reported in *The English Novel* and because of the quotations given by Ward that the unfavorable—and unfair—comparison of Whitman with Lanier began to be made, and that the two, who had so much in common, both in their interest in new and freer forms of verse and in their desire for a purer, finer national life, were set in contrast with each other, to the disadvantage of one or the other, by partisans of each. It was with quotations both from *The English Novel* and Ward's memorial that Thomas Wentworth Higginson, in an article on Lanier contributed to the *Chautauquan* for April, 1887, sought to prove his contention that:

> There could be little in common between the fleshliness of *Leaves of Grass* and the refined chivalry that could write . . . "The Symphony." . . . A man who, with pulmonary disease upon him, could still keep in his saddle as a soldier, could feel but little sympathy with one who, with superb physique, preferred to serve in hospital—honorable though that service might be for the feeble-bodied.

Higginson, an estimable gentleman, a brave soldier, and a genial critic, had met Whitman and disliked him personally. He admired Lanier's poetry and his spirit, and wrote often in praise of him. And because he repeated his comparison often—in *Women and Men* (1888), in *Contemporaries* (1899) and elsewhere—and because he enjoyed in his day considerable prestige as a critic and his works were much read, Higginson's idea of the utter dissimilarity of Whitman and Lanier became the accepted one, and it became—in the minds of Lanierolators—something of a sacrilege to think of their "Sir Galahad of American literature" (as Higginson called him) in association with outspoken, sensual old Walt.

But if Lanier's partisans insisted on the utter dissimilarity of Lanier and Whitman, Whitman's did likewise, often making unkind fun of the spirituality of one whose unearthiness was always more apparent than real, the unearthiness of one being rapidly consumed by disease and cut off for almost the whole of his literary career from the normal pursuits and interests of normal or healthy men. Horace Traubel, writing in *The Conservator* for October, 1896, sought to answer the question asked by a correspondent: "What was Lanier's opinion of Whitman?" "At different periods Lanier had different opinions,"

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Traubel said; and printing Lanier's letter to Whitman of May 5, 1878, a comment from Ward's memorial and the paragraphs quoted by Ward, Traubel added: "I trust the decision to the judgment of my correspondent." William Sloane Kennedy, chronicling *The Fight of a Book for the World* (1922), divided famous men into classes determined by their attitude toward Whitman, and grouped Lanier with the "Bitter and Relentless Foes and Vilifiers of Whitman." And Kennedy referred to Lanier's discussion of Whitman in *The English Novel* as "eighteen pages of scurrilous vituperation," which even in the emasculated version of Browne's 1883 text it certainly is not.

Whitman died March 26, 1892. Five years later, its preface dated January, 1897, appeared a revised edition of Lanier's lectures on the development of personality, with the original but misleading title of *The English Novel* retained. In a "Prefatory Note" to this new edition of her husband's lectures, Mrs. Lanier explained again that illness had prevented her taking any part in the first publication of the lectures, and graciously—but somewhat ambiguously—she went on: "Many mistakes resulted: some from the copyist's unfamiliarity with [Lanier's] feeble handwriting, and others from the former editor's uncertainty regarding Mr. Lanier's final wish at various points. New plates have permitted a thorough revision . . . and the restoration of several omitted passages."

Collating the 1883 with the 1897 edition of *The English Novel* we discover easily the extent to which Browne had tampered with Lanier's text. He had omitted the long paragraph published by Mrs. Lanier in *The Nation*, which precedes a discussion of democracy in art that includes an interesting comparison of Whitman and Wordsworth. He had robbed Whitman twice of credit for his characteristic theory that "science will . . . destroy *old* imaginative products and build up a new formless sort of imaginative product in its stead." He had considerably truncated a passage quoted by Lanier from Whitman's essay on "The Poetry of the Future." He had omitted entirely an interesting comparison of Whitman's verse form with that of Anglo-Saxon verse (in particular, the "Song of Myself" with the poem known variously as "The Battle of Maldon" and "The Death of Bhyrtnoth"). He had made Lanier assert that "the actually existing democracy have never accepted Whitman," whereas Lanier had written not "Whitman" but "Whitman's poetry," and the difference

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in phrase is important. He had changed Lanier's respectful phrase "young artist of the Whitman school" to read, somewhat contemptuously and flippantly, "young versifier of the Whitman school." He had omitted from a summarizing reference to Lanier's discussion of Whitman's belief that his poetry was truly democratic, the parenthetical phrase "belief (which I feel sure is most earnest)." He had made Lanier call Whitman "brawny" instead of "sturdy" and had omitted the prefatory "Mr." from another reference to him. Typical of Browne's omissions is that of a single parenthetical phrase, a phrase the restoration of which gave an absolutely different cast to the tone of Lanier's remarks about Whitman's "dandyism": "I do not mean this disrespectfully," Lanier had written.

In the revised—more properly, restored—text, Lanier's discussion of Whitman and Whitman's poetry seems anything but flippant and prejudiced. Nor does it seem a retraction of the enthusiasm Lanier had so generously and unreservedly expressed in his letter to Whitman written three years before these lectures were delivered. Actually it was an expansion of ideas stated in the letter. Lanier never accepted Whitman's theories of form (or formlessness) in verse, in spite of his own liberal, often radical attitude concerning form; and Lanier, for various reasons, refused to use or countenance the use in poetry of many terms Whitman used freely.

Lanier believed that science, instead of destroying art and all imaginative work generally, would bring man into closer contact with nature, the source of art, and reveal to man more beautiful and more varied art forms. He believed that Whitman had failed, as Wordsworth had failed, in his attempt to write in "the language of conversation in the middle and lower classes of society." And he believed that Whitman's attempt to do so had failed because Whitman had ignored a fundamental characteristic of poetry, and because it was a self-conscious and sophisticated attempt. He believed that as there was nothing essentially new in Whitman's rhythms or verse forms (both being marvellously like the Anglo-Saxon), so there was nothing essentially new in his dandyism—his coatless, open shirt, breast exposed posturings, although Whitman's dandyism was the customary dandyism upside down. And, finally, he quarreled with Whitman's conception of democracy because he believed that Whitman's democracy is really the worst kind of aristocracy, "being an aristoc-

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racy of nature's favorites in the matter of muscle"; and he differed with Whitman's theories of poetry because Whitman demanded strength rather than beauty, and the need of beauty, Lanier knew, has not yet vanished from the world.

But that Whitman, in claiming to scorn beauty, often achieved it Lanier knew and asserted; and that as a critic of his times he was a prophet to be heeded, Lanier asserted just as boldly as he denounced Whitman's mistaken theory of athletic democracy. Lanier found in Whitman's poetry what he found in Shakespeare's and in Sidney's and in the poetry of the nameless Saxon bards—a quality of "elemental manhood" (as Dr. Edwin Mims happily labels it) which others have found in Lanier's best poetry as well. Lanier, like Whitman, had the utmost contempt for all that was mean and small, artificial or affected, and he lamented as Whitman did the lack of "elemental manhood" in the literature and life of his day. To Bayard Taylor he had once complained: "In looking around at the publications of the younger American poets I am struck with the circumstance that none of them even attempt anything great. The morbid fear of doing something wrong or unpolished appears to have influenced their choice of subjects." Whitman attempted greatness, and the greatness and the beauty he achieved Lanier valued.

Lanier and Whitman, in spite of apparently irreconcilable differences, had much in common, as E. C. Stedman pointed out long ago in *The Nature and Elements of Poetry* (1895), much to understand and appreciate in each other, and this Lanier at least realized. Each sought to give new vigor and new beauty to poetry. Each wrote on themes that were large and nobly conceived. Each was a champion of personal liberty—Lanier of liberty of thought and belief if not of bodily freedom. Each inveighed against orthodoxy and blind allegiance to the past. And Lanier even went beyond Whitman in preaching an industrial democracy, in attacking industrialism—Trade, as he called it—as "war grown miserly," deadly to life and civilization.

Lanier, moreover, was quite as radical in his theories of verse as Whitman was, no matter how apparently conservative in his practice. In *The Science of English Verse* he wrote:

> I am strongly inclined to believe that English poetry might be a great gainer if we would at once frankly recognize . . . rhythmic but unmetric verse as a strictly-rhythmised prose, and print it as such without the deceptive

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line-division. Particularly in using the rhythm 3/8 in English verse [the rhythm Lanier found in "The Battle of Maldon" and in the "Song of Myself"] a certain finicalness attaches to a regularity of line-grouping: while if it be employed without lines, but merely in great masses of unlined prose, the effect is noble in the highest degree. A development of English rhythm lies, I feel sure, in this direction.

Lanier's own experiments in verse of this sort, suggestive of his identity of purpose with Whitman, his striving to beat old terms into new poetic gold and to preach a gospel of rugged individuality, are to be found, not in the volume of collected poems, though there is much even in some early poems, in "The Ship of Earth," in "The Crystal," in "The Psalm of the West," as in "Individuality" and more especially in "The Marshes of Glynn." Rather are Lanier's freest experiments and most Whitman-like poems to be found among the "poem outlines" not published until long after his death. Not all of the numerous so-called "poem outlines" are undeveloped or hastily sketched poems, but many are complete and finished in themselves. That Lanier himself might probably never have published these poems is admitted, but it is significant that he wrote them. They manifest his determination to be boldly independent in forging verse form as another poem written in perfectly conventional verse-form—"Remonstrance"—reveals his bold attempt for orthodoxy of belief and opinion.

Lanier was far from being a timid, unquestioning accepter of the heritage of the past. That in his own verse he yielded as much to orthodoxy of custom and opinion and verse-forms as he did was the result of a sincere belief that by doing so he would in the end be able to sing to a greater number of people than if he had, like Whitman, made no effort to temporize and compromise. In a prose essay written probably in the very month in which he ordered from Whitman a copy of *Leaves of Grass* Lanier expressed in the most unambiguous language the difference between his conception and Whitman's of the obligation of the poet to his audience and to his art. He wrote there:

> I do protest that the greater the artist, and the more profound his piety toward the fellow-man for whom he passionately works, the readier will be his willingness to forego the privileges of genius and to cage himself in the conventionalities, even as the mocking-bird is caged. . . . [His fellow-men] he can reach through the respectable bars of use and wont; in his wild thicket of

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lawlessness they would never hear him, or hearing, would never listen. In truth, this is the sublimest of self-denials, and none but a very great artist can compass it, to abandon the sweet green forest of liberty, and live a whole life behind needless constraints, for the more perfect service of his fellow-men.

But Lanier in his cage sang the same song as Whitman in his forest.

And as Lanier admired and appreciated Whitman, so there is some ground for the belief that Whitman might have found pleasure if not in the melodious poetry of his self-imprisoned fellow-bard, certainly in the friendship that Lanier offered him. The references to Lanier in Traubel's several volumes of recorded conversations with Whitman are presented in a manner that makes them seem most uncomplimentary to Lanier, but when analyzed they prove to be not at all unfriendly. "Study Lanier's choice of words," Whitman said; "they are too often fit rather for sound than for sense." But he added, excusing him, "His ear was over-sensitive. He had genius—a delicate, clairvoyant genius: but his over-tuning of the ear, this extreme deference paid to oral nicety, reduced the majesty, the solid worth, of his rhythms." And from Edmund Gosse's accusation of being "never simple, never easy, never in one single lyric natural and spontaneous for more than one stanza," Whitman defended Lanier, although somewhat half-heartedly, it is true: "Gosse don't seem to take himself seriously: why should anyone else do so?"

"Lanier was tragic in life and death," Whitman said; and as if to explain forgivingly Lanier's failure as a poet he went on: "He had the soul of the musician—was a flute player: indeed, in the accounts, was phenomenally fine. This extreme sense of the melodic, a virtue in itself, when carried into the art of the writer becomes a fault. Why? Why, because it tends to place the first emphasis on tone, sound—on the lilt, as Rhys so often puts it." Whitman in 1888, when he spoke thus to Traubel of Lanier, was old, sixty-nine, ill, and tired of a world that had not proved greatly friendly or appreciative of his verse, that seemed at times, save for Traubel, O'Connor, and a few others, full of apostates and hypocrites. Still, rereading Lanier's letter written ten years before, and contrasting the generous tone of it with what his disciple O'Connor called Lanier's "savage (and silly) attack" on him in *The English Novel*, Whitman could say "Lanier was a beautiful spirit: he had his work to do: did his work. . . ." It was a tribute Lanier himself would have appreciated.

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The Germans: Unhappy Philosophers in Politics

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THE fascist movement in Germany is, in certain of its aspects, merely a figure in the general pattern which is being woven in the whole of modern civilization and with which events in Italy and Japan have made us familiar. Even the nationalist victory in Britain in 1931 and the Rooseveltian program in our own country reveal elements roughly analogous to Hitler's movement, the elements of increased national sentiment, of the abrogation of democracy, and of stronger state control upon industry. What is distinctive and unique in the Nazi movement of Germany is derived in part from the political temper of a defeated nation and in part from unique characteristics in the German nature. The Germans are philosophers and they have the intellectual's unhappy penchant for consistency. They are therefore particularly inept and unhappy in the game of politics, for the complexities of politics demand improvisation and compromise.

Fascism, as a general movement, is the characteristic defense of an imperiled social system. Most of the Western nations are developing fascist tendencies because the poverty and the disillusionment of the post-War period have given the radical political parties sufficient strength to challenge the established order. One method of meeting this challenge is to identify national peace and social unity with the established order and thus to place those who wish to change the system under the disadvantage of threatening social peace. Fascism exploits national and patriotic sentiment in favor of the present organization of society. This was done by the British Tories in 1931 no less than by Hitler. The difference is that the British appealed to the patriotic sentiment of the man in the street without being under the necessity of establishing a cult in nationalism and racialism. The Germans, with their passion for consistency, met the Marxian doc-

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trine of the class struggle with a highly elaborated philosophy of *Volk und Rasse*, of nation and race. Hitler was of course not the philosopher who developed this philosophy. He was the demagogue who exploited the resentments of a defeated nation and the apprehensions and discontents of a divided people in terms of that philosophy. But once Hitler fanned the flames of racialism there were dozens of philosophers, historians, and theologians who fed the flames with tinder gathered from everywhere. If they were philosophers they reconstructed Hegelian thought in order to give dignity to the new emphasis upon *Staat und Volk*. If they were theologians they rediscovered Luther's theory of the *Schöpfungsordnung*, of "God's order of creation," to give preeminence to the organic relations of life, race, family, nation, and vocation against the more "rationalistic" social constructions of the class and the international order. "Rationalistic equalitarianism" and "rationalistic internationalism" are thus at a complete discount in Germany today. Whether the philosopher uses Hegel or the theologian appropriates Luther, the results are remarkably similar. The state and nation is affirmed as the community of most significant loyalty against the competing communities of the class and the international order. This is a general tendency in the whole of modern civilization; but in Germany it is given a consistent elaboration unknown in other countries and therefore makes for a fanatic state absolutism.

The philosophic temper of the Germans may hardly seem to be the cause of the kind of public hysteria which Hitler, with the aid of Dr. Goebbels, his genius for technicized propaganda, has been able to create in support of his program. Yet the two are related. Intellectualism divorces the intellect from its organic relation to the emotions. The intellect does not come into a fuller control of the passions by that divorce. It becomes enslaved to them. The emotions, in this case the fever of patriotic sentiment, are fanned by an arch-demagogue like Hitler and an expert propagandist like Goebbels, and the professors, thinking in an atmosphere created by this artificially aroused emotion, invent, elaborate, and rediscover theories of state and nation which establish the cult of nationality to its final consistency and absurdity.

Only by such cooperation between demagogues and philosophers is it possible for Hitler to attempt a state absolutism more unqualified

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than any ever attempted by monarchical autocrat. Bismarck respected the particularism of the South-German states. Hitler appoints governors to administer the affairs of Bavaria and Wuertemberg. The Kaiser was forced reluctantly to grant freedom of organization to the trade unions. Hitler brings trade unions totally under the ægis of the state and completely destroys the bargaining power of the laborers. Every kind of trade association, cultural organization, religious institution, and trade union must submit to the passion for "coordination," i. e., must sacrifice its autonomy to the monolithic state.

One has the feeling that the kind of state which Hitler is creating is the typical handiwork of a man lacking the necessary shrewdness of a real statesman. It does not do justice to the complexities of modern life and it is not fitted to relax tensions where they threaten to reach a breaking point. Hitler's state is the product of a demagogue suffering from megalomania and not certain enough of his power to qualify its exercise. But the personal weaknesses of a Hitler could not result in such a personal creation if the cultural and economic factors of the nation did not play into his hand. The economic factors which make for fascism are given in the whole disintegration of the economic structure of Western civilization and therefore affect other nations as well as Germany. The cultural factor peculiar to Germany is its intellectualism which permits the development of one theory of government and politics to a degree of consistency which renders it absurd.

The anti-Semitism of the fascist movement is intimately related to the extravagant nationalism which it is developing. If the state and the nation are to be absolutized as the Nazis are doing, the concept of state and nation must stand for something more than a political order. It must be "spiritualized." It must stand for an organic fellowship, not for a technical political cooperation. Thus it is *Volk* rather than state which is apotheosized by the Nazis. The blood brotherhood of the race, the *Volksgemeinschaft*, is what is arousing all the sublime passions of the frustrated young men of Germany. The reverse and darker side of that passion is anti-Semitism. The poor Jews must pay in misery and poverty for the rediscovery by German youth of their "Germanic" unity. Anti-Semitism is, of course, something more or less than the dark side of the rediscovery of *Volk*. Since fascism is the political tool of the impoverished pro-

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fessional and middle classes and since it does not propose significant economic measures to restore these classes to prosperity, it will supply this defect by destroying the business of Jewish merchants and vacating the positions of Jewish professionals and bureaucrats. Thus it will create the illusion among some thousands of its followers that it has actually provided a "new deal." Furthermore anti-Semitism is a handy instrument of the anti-liberal and anti-radical purposes of fascism. Since Jews are prominent in the leadership of both the liberal-democratic and the communist-socialist movement the program against the Jews is a powerful thrust at radicalism and liberalism. Anti-Semitism is in short an instrument of the class struggle in Germany. The brutal vigor with which that instrument is being used would revolt the souls of the more decent Germans, however, were it not for the fact that they are completely obsessed with their new cult of race and nation. They recognize the brutality but regard it as an inevitability in the struggle of Germany for racial solidarity. They are inclined to answer misgivings in the words of Southey's famous poem, "After Blenheim," "Things like that, you know, must be in every famous victory." Anti-Semitism is not a vice peculiar to the Germans. It still flourishes in every nation which has a considerable body of Jews within its national boundary. But most of the cultured nations manage by both honest effort and dishonest and hypocritical pretension to qualify and to obscure the fact of race prejudice. Only philosophers like the Germans can work themselves into a state of mind in which they regard race conflict as one of the inevitabilities of a world which must cherish racial solidarity. Thus, again, its demagogues operate in an atmosphere created by innumerable pedants and their pedantic elaboration of the cult of *Volk und Rasse*.

The anti-democratic creed of Hitler is unique only in the consistency with which it is stated and even in that it is very similar to Mussolini's ideas. But here again the Germans give the general development of modern politics, with its preference for dictatorship over democracy, a passionate avowal which threatens to destroy every democratic safeguard. The destruction of democracy is a part of the pattern through which the whole modern era expresses itself politically. There are many reasons for this. Democracy presupposes the willingness of a minority to acquiesce in the policies of a majority.

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Such a presupposition holds only as long as the differences between minority and majority are not too great. When the differences between them represent the differences between two diametrically opposed social systems, capitalism and socialism, it cannot be assumed that either the one or the other will yield the power over the state without making an extra-constitutional and non-parliamentary effort to maintain itself. The most parliamentary of all socialist parties, the British labor party, has been steadily moving to the left in the past two years and is no longer as sure as it once was that it can establish socialism unless an effort is made by capitalism and the old order to maintain itself against a parliamentary socialist venture. Thus British socialists, even when they insist on constitutional means, are no longer certain that their enemies will abide by the constitution. Harold Laski has written a book, *Democracy in Crisis*, to prove that labor ought to be constitutional in its bid for power but that it ought not to expect its enemies to abide by the constitution, once they are confronted with a resolute socialist majority in parliament, irrevocably intent upon nationalizing industry. Even as comparatively mild a laborite as Sir Stafford Cripps recently declared: "If, when labor gets power, the other people want to cause a revolution, I want to have control of the armed forces and the police before the revolution starts." In other words there are doubts and apprehensions in the mother-land of constitutional democracy about the ability of parliamentary democracy to resolve the ultimate conflict between capitalism and socialism.

If such doubts can arise in England it is, perhaps, not surprising that the social struggle should have led to the abrogation of democracy in Germany. That fascism finally developed from the right rather than a dictatorship from the left is due partly to the fact that the socialists were wedded to the democratic creed and piously disavowed every non-parliamentary procedure. In 1919 the socialists had 46 per cent of the votes and a corresponding prestige. They wrote the Weimar constitution in its essential outline. They could have taken power and could have destroyed the Junkers who conspired fourteen years later to destroy them. But the socialists had given up their rigorous Marxism before the War. A man by the name of Kautsky had transmuted Marxian determinism into a sleepy kind of fatalism and had persuaded the socialists that the self-

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destruction of capitalism and the victory of socialism were so certain that the socialist party need only wait for the inevitable. Consequently the socialist party waited and meanwhile participated in the innumerable inter-party maneuvers by which liberals, Catholics, and socialists tried to maintain parliamentary government and through which parliamentarism became ultimately discredited. In the end it was discredited because it was unable to resolve the conflict between two almost equally powerful camps of reaction and radicalism. The power of the comparatively small Catholic party through all the post-War years rested upon its ability to work out *ad hoc* compromises between conservatism and radicalism. The socialists meanwhile had made such a fetish of the Weimar constitution that they could do nothing but make futile appeals to its authority even when it became apparent that their enemies would no longer abide by it. Thus Von Papen destroyed the socialist-Catholic government of Prussia by non-constitutional means and the socialists countered his move by an appeal to the supreme court. The impatient younger generation meanwhile had become convinced that democratic procedure could not resolve the impasse of the social struggle and give the political life of Germany a clear direction, either to the right or to the left.

Parliamentary government was furthermore discredited in the eyes of the resentful young men of Germany because the liberal and socialist parties who maintained it were also responsible for the various policies of *Erfuellung*, of conciliation with the victorious allies. Acceptance of the Dawes plan, the Young plan, the Locarno agreement, etc., were expected by the liberals and socialists to emancipate their country gradually from the thraldom of an unjust peace. To the young men of Germany it seemed as if their nation was being more and more completely enslaved to the outside world. The stage was thus set for the fascist venture. In it the fears of the privileged classes, the nationalistic resentments of an entire nation, and the impatience of the young people of all classes were compounded to create a tremendous driving force. The fascists did what the socialists might have done in 1919 but lacked the courage and resourcefulness to do. They used the democratic method to carry them as far as possible to power. They negotiated the rest of the distance by non-parliamentary and non-constitutional means and then destroyed the

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instrument of democracy so entirely that their enemies could not avail themselves of it.

The success of fascism depended upon the possibility of welding the impoverished middle classes into one political party with the richer industrialists and landed aristocrats. Only a demagogue could perform a task like that. For this very reason Hitler rather than Von Schleicher is ruling Germany today. Von Schleicher wanted a semi-fascism which would be "neither capitalistic nor socialistic." In attempting to establish a basis for his fascism broad enough to include the world of labor he lost the support of the landowners and industrialists who, through Von Papen, undermined his influence with Hindenburg, at that time the only key to state power. In his place came Hitler, who talked with more demagogic skill about the unity of the nation but who actually had a narrower basis for his authority, the basis being the money power of the wealthy and the votes of the impoverished middle classes. Thus Hitler used the democratic instrument of the vote more successfully than Von Schleicher to abrogate democracy more completely than Von Schleicher had intended.

Fascism is, in other words, an instrument of the social struggle in Germany, as it probably will be in every other Western nation. But no fascist demagogue will ever have as many philosophers and pedants to support his creed as Hitler is able to claim in his support. A whole new school of political thought has been developed in recent years with the avowed purpose of discrediting democracy. Democracy, it is declared, is an illusion of the "Age of Reason" and nothing is so completely at a discount today in Germany as the thought of the eighteenth century. According to this new school, democracy is rationalistic and individualistic. It believes that society is established by a social contract between individuals who conceive of themselves as atomic individuals; whereas, in fact, the individual is organic to society from the beginning. This organic relationship of the individual to society cannot be expressed in terms of democracy. It can be expressed only in the symbolism of the leader's authority over his people. Logically this thought leads to monarchical conceptions and to the theory of "divine right." Practically it is being used at the moment to maximize the authority of the man who throughout Germany is being hailed as "The Leader." In this whole develop-

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ment theologians are cooperating with philosophers, the theologians using Luther as the philosophers use Hegel to discredit democracy.

There are no doubt weaknesses in the creed of the nineteenth century democrats which these wise men of Germany are uncovering. It may be that modern democracy has been too much the development of middle class life and has therefore been too individualistic and too little appreciative of the organic character of social life. It may also be true that communism substitutes a rationalistic mechanistic collectivism for a rationalistic mechanistic individualism and that both the individualism of capitalism and the collectivism of communism fail to do justice to important aspects of social life. Some modern German social thought is really very illuminating in exploring these defects of both democratic and socialistic thought.

But again the passions which demagogues arouse and the consistencies in which pedants indulge have been combined to discredit democracy so completely that it will not be available to the German people when they have need of it. Democracy is after all a peaceful method of arbitrating conflicting interests. If it should be true, as it probably is, that conflicts of interest may become too sharp to be amenable to democratic arbitration, it does not follow that democracy has become a useless tool.

Every society must either resolve the conflicts of interest within its communal life by the methods of democracy or it must use force to subject the interests of one group to those of another. It is of course true that democracy may be the means of oppression as well as a method of arbitration. That is why the disinherited classes of Western civilization are so cynical about the pretensions of democracy, and it may be necessary therefore on occasion to challenge the pretensions of democracy with force. But it must be clear that pure force is always a method of warfare and not a method of arbitration. It may be used to gain a victory for the proletarian class over the middle classes or of the middle classes over the working class. It cannot be used to harmonize the conflicting interests of various classes or functional groups. The pretensions of the German fascists that they have abrogated democracy for the sake of creating a unified people are therefore worse than any pretensions ever made in behalf of democracy. Every indication is that German labor, having lost both the vote and the bargaining power of col-

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lective industrial action, will have its living standards increasingly debased. German industry will become a vast sweatshop for the world by the very policies which were to redeem the German people from their slavery. Since no amount of fascist oppression will be able to destroy the opposition of German labor to this ruthless effort to reduce it to permanent slavery, fascism can maintain itself in Germany only until its oppressions have ripened the resentments and the vehemence of the labor world and have healed the breach between socialism and communism.

It may be that fascism will be in power in Germany for several decades to come. But it must count on a stronger opposition than it faced in Italy, for Germany is a more highly industrialized state and the power of the industrial worker is correspondingly greater. When the day of reckoning comes there will be no method for the dissolution of the old order and of reconstruction but through a bloody civil war. It may be that a similar fate awaits every Western nation. But that is not absolutely certain for other nations and it is practically certain for Germany. Her fascist venture has blocked the way to any peaceful resolution of the difficulties which Western industrial nations face. The very consistency of her awakened nationalism will breed an internationalism as consistent among her dispossessed. Fascism and communism must face each other in fratricidal conflict; and in that conflict many of the values which German social philosophers think they have saved in the present development will be irretrievably lost.

The Germans are in short too consistent in their thought and action to be able to deal advantageously with political problems. They could learn a great deal from the English who are not as intellectual but more sane in their approach to human and social problems. "What governs an Englishman," declares Santayana, "is certainly not his intelligence." The British maintained their organic conception of society even while they perfected the instruments of democracy. They take the organic character of national life for granted while the Germans engage in passionate arguments to prove that a nation is more than a conglomerate of individuals. British socialism has been a hodge-podge of ideas and never consistently Marxian. But experience is driving it more and more to the left where the more consistent Marxian socialism of Germany was fifty years ago.

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British socialism, learning slowly by the experience of history, arrives at this left position at a time when German socialism is practically annihilated under the heels of a victorious fascist foe. British labor is united and German labor was divided into socialist and communist camps. That division was one cause of its undoing. The German socialists were doctrinaire parliamentarians and the communists insisted on the pattern of the Russian revolution for the complexities of German political life. The British socialists will probably lose some of their confidence in pure parliamentarism and will move in the direction of pragmatic radicalism with a united front. Thus political doctrines grow directly out of experience in British life. That is possible because the British are sane rather than intellectual, i. e. they apply their intelligence directly to the situations in which they stand and they are thus able to gauge and apprehend the imponderables of politics in a way which no consistent political theory is able to do.

Furthermore there is a possibility that the privileged classes of Britain may yield before the tensions of modern industrial society result in civil war. They do not yield easily. No dominant class does. But they usually do yield just a moment before it is too late. That is their policy in India and that is what they have done in the long struggle of the middle classes against the landed aristocracy. The decline of capitalistic civilization will create some crises which may demand too much even of the dominant classes of Britain. There is in other words no certainty that modern civilization will evolve a social system adequate to the necessities of a technological civilization without social convulsion and confusion. But if it is possible at all, political muddlers like the British are more likely to succeed than philosophers like the Germans.

The Germans will probably always produce more interesting philosophy than the British. They explore the heights and the depths of life more fully. The greatest philosophers of Britain were significantly empiricists like John Locke and David Hume. In the field of philosophical idealism, more typically the field of philosophic generalization, the English have had to borrow from the German Kants and Hegels. Nor have the English had an optimist as consistent as Leibnitz or a pessimist as thoroughgoing as Schopenhauer. No one has expressed as ruthless a revolt against Christian morality

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in England as did Nietzsche; and the most consistent philosophy of rebellion against a bourgeois civilization was developed by a German Jew, Karl Marx. In as far as the catastrophic element in Marxism did not seem congenial to workers, who were beginning to reap some benefits from industrial civilization, it was revised by another German Jew, Eduard Bernstein and the revision was more consistent than the semi-socialism of English Fabianism. In Germany every social strategy is supported by a complete *Weltanschauung* or world view and every political attitude is developed into a religion. The German socialists had a completely irreligious and *Vaterlandslose Weltanschauung*. They did not live up to their revolutionary faith and they proved themselves in the War and after to be as patriotic and nationalistic as their British fellows. But their creed aroused and seemed to justify the nationalism which has now destroyed them.

The Germans arm the warriors of every political camp in the rest of the world with weapons of the spirit. They are so adept at sharpening these weapons to a razor edge and feel so obligated to experiment with them upon each other that their body politic bleeds from many wounds and betrays scars as numerous as those found on the youthful faces of a German *Studentenschaft*. Thus the Germans develop a strategy of political reaction to a consistent fascism and will probably be the first to dissolve this fascism into an equally consistent communism. But they will probably continue to be without peace or serenity in their political life and will be last to bring peace to a tormented world. If they could only be as unintellectual, or even unintelligent, as the British, they might be a saner and certainly a happier people. The social problems of the modern world must be solved by the guidance of clear and unambiguous principles; but when principles are applied to the actual complexities of a specific situation the clairvoyant intelligence of the statesman is more helpful than the philosopher's passion for consistency.

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The Evolution of Eyes

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AGES ago a dark but massive star, passing by some curious accident too close to the sun, tore off several volumes of matter of greatly varying size, which, assuming rotary motions around the sun as a common center, became planets. Earth is, therefore, in a sense quite literal, a child of the sun.

When earth had cooled and life had begun to appear in its tepid waters one of the first things that life began to develop was eyes—eyes, with the power to look back at the parent or to behold all the things of earth in that parent's illumination.

All those earlier forms of life, having been totally devoid of skeletons, have failed to persist in the rocky records of the earth. There is, however, to this day, still extant on earth one of those earliest forms of life, the ameba. That is the lowliest of all known animals and yet, in a sense, it possesses eyes. Its entire body is an eye.

In order to understand the exact nature of these earliest and most primitive eyes one must remember that all the functions of the ameba are generalized. When an ameba procreates it simply narrows in the middle, keeps narrowing, divides. Then there are two amebæ. There are no ameban sex-organs because the ameba is all sex-organ. When the ameba wishes to eat and digest food it merely flows, or wraps itself, about the desired particle, secretes hydrochloric acid upon it, and absorbs so much of the particle as it can use. Then it unwraps itself from the indigestible residue. The sense of touch in the ameba is also generalized—present in all of its body, just as it still is today in nearly all of the body of a human being. Similarly, the ameba has no eye because it is all eye. Just as every portion of the ameba can feel, so every portion of the ameba can perceive light.

Passing a little higher in the scale of life we come to a very simple animal which possesses a specialized eye. That is the Euglena viridis. It has also a specialized mouth—a particular place, or opening, for the in-take of food. Just below that mouth lies a tiny rose-colored boss, the Euglena's eye, simplest of all specialized eyes on Earth.

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That eye, however, never perceives a picture of the outer world. It is simply a thermometer and a photometer. In other words its function is to measure the intensity of the heat and of the light in its owner's surroundings. The light-measuring function is shown by an interesting experiment. A rectangular box is divided by two parallel partitions into three compartments and then ooze and water are poured over the floor of them all. Tiny passages are provided through the two partitions. One end-compartment is illuminated brightly, the middle one slightly, and the third not at all. The Euglena is then placed in the black compartment. In a short time it is found in the twilit, or middle, compartment. If placed in the brightly lighted compartment it soon will again be found to have passed into the middle, or twilit, compartment. Placed in the middle compartment in the first instance it simply stays there. It knows what is best for it, and it comes to know that by means of the pigment-eye. Simple as is that pigment-eye, the Euglena, without it, would soon perish.

Now the Euglena's eye, all-important though it was for the life of the Euglena, was not a good eye. For one thing it was always being injured because it projected beyond the surface of the animal's body. Some Euglenas happened to differ from other Euglenas (no two animals, even of any given species, ever being precisely alike), and the Euglenas with the less projecting eye-spots and especially those with spots depressed a little below the level of the surface suffered less injury to their eyes, were therefore better adapted to the struggle for existence, and went on, some of them at least, to higher and better forms of being.

In time the bit of precious pigment became, in some of these forms, habitually set deep down on the bottom of a cup-shaped depression, or pit, a kind of eye still seen today in some of the worms, notably the Capitellidæ. The cup, or pit, appears to exist only for the purpose of giving protection to the pigment. And yet it is very plainly the forerunner or ancestor of the globe of the human eye.

Here it would seem important to recall the fact that all the higher forms of eyes are simply small picture-cameras—kodaks. That is a very old comparison, the likening of an eye to a camera obscura (a

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comparison first made, I believe, by Giambattista della Porta, in the 16th century) and yet ever since that master's day it has proved indispensable to any one who seeks to explain the nature of eyes.

Essentially a camera obscura is a box with a small hole in one end and a screen, or plate, at the other. The light enters the box through the hole and, if the hole be small enough, it transforms the light into a picture on the screen. A person standing in the big box of an old-time camera could see on the screen a picture of the world outside. That was a very interesting fact in Porta's day. Not in Porta's day, however, but long after, in the early 19th century (the day of Niepce and Daguerre, inventors of photography) a light-sensitive plate could be substituted for the mere screen and, after an exposure of the plate to a picture formed upon it of the outer world, it could be removed (being protected from light in a plate-holder) from the box, taken to a dark-room, and there "developed" (from a picture potential to a picture actual) and also "fixed" (so that further exposure of the picture to light would not efface the picture from the plate).

It had likewise already been discovered (by Porta) that a convex lens set just behind the hole in the front of the camera would give a sharper picture, and that an accordion-like arrangement in the walls of the box—one that enabled the box to be shortened or lengthened at will—gave the photographer a chance to "focus" his camera accurately in accordance with the distance from the camera at which the object to be photographed stood.

Now note well the comparison which is so easily and correctly made between the photographic camera obscura and the little living camera of the eye, a device which antedated the humanly invented camera by millions on millions of years. The eye is simply a living photographic camera. Its box, to be sure, is not rectangular but globe-shaped because, of course, it must rotate in a socket and a rectangular box cannot so rotate. Then again the non-living camera, being a box with rigid sides, contains in its interior nothing but air. The eyeball, however, being a mere sack which, without interior support, would fall all together, collapse and be useless, is filled with a transparent liquid; and in order that the liquid may not escape from the eye there is a glassy, exceedingly transparent, convex, watch-crystal-like cap placed over the front of the eye—the so-called "cornea."

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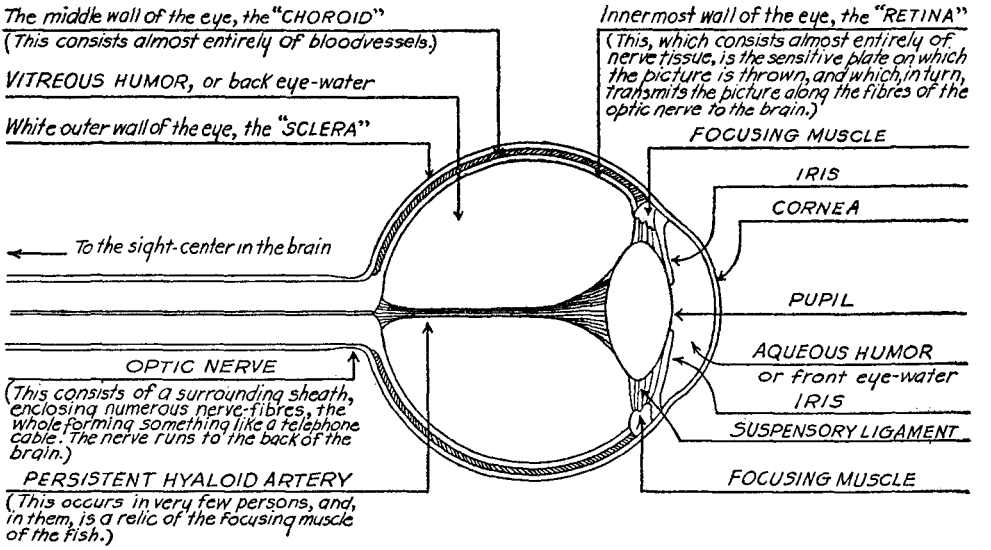

Diagram showing the camera-parts of a human eye—also the non-camera-like "cornea" and "optic nerve." This eye is supposed to have been hardened and then split in two fore and aft by a knife held vertically.

Precisely like the man-made camera, the globe of the eye presents a hole for the admission of light into the eye's very transparent interior. In the case of the eye the hole is called the "pupil," the small black spot which every one has observed in the center of each of every one else's eyes. Just behind that hole, precisely as in a photographer's camera, there stands a convex lens, ready at all times to weave the entering light into a better picture than the mere hole or pupil alone can do, and cast it on the sensitive plate (retina) in the back of the eye.

The light, falling on the front of the eye, passes first of all through the cornea, then through the front eye-water (aqueous humor), then through the lens, and, finally, through the back eye-water (the viscous, or vitreous humor) to the retina. So faithfully like a camera are the higher forms of eyes that even the black cloth which the photographer ordinarily drapes down over the front of his camera when it is not in use is imitated by such eyes. In other words, the higher forms of eyes have eyelids.

There is, however, one great and highly essential difference between photographic cameras and eye cameras. The photographer at the end of an "exposure" removes his sensitive plate or film from the back of *his camera*, whereas from an eye the sensitive plate (retina) is never removed. It stays steadily *in situ* (barring accidents

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of course) from the cradle to the grave, receiving through all its owner's waking hours countless trillions of tiny motion-pictures and transmitting them along the fibers of the optic nerves (one from each eye) to the "sight-centers" in the back of the brain, where the developing, the fixing, and all the "seeing" of the pictures are really performed.

The importance, in the matter of eye development, of pit-eyes can now be appreciated—the eyes, already mentioned, which consist of a pit somewhere on the surface of the animal's body with, at the bottom of the depression, the precious particle of light-sensitive pigment. That pit was the beginning of the globe-shaped eye, the eye that resembles a camera.

Nature, discovering, after a long time, that bits of sand and other small bodies would get down into the pit and injure the precious spot of pigment hidden there, filled the pit up with a viscous transparent material that would not flow out of the pit and would keep the pit filled, thereby excluding foreign bodies, while at the same time light was transmitted freely through this protective material to the sensitive pigment. Still no real picture was formed in the eye. Yet it is likely that eyes like these do yield to their possessors some knowledge of the direction from which light comes and this marked a very important advance. The main thing, however, was that the viscous fluid which filled the little pit was the ancestor of man's vitreous and aqueous humors (the eye-water, already mentioned, which keeps the eye-camera distended in the form of a globe).

But nature still seemed to think—if one still may so express the situation—chiefly of safety for that bit of precious, light-sensitive pigment. And therefore, inasmuch as foreign bodies did get down easily even into and through that viscous humor, and then did not readily get out of the pit again; and also inasmuch as the humor itself, in spite of its viscosity, would often run out of the eye and be lost; nature ran a shoot of integument across the pit, converting it into a closed pit, and, incidentally, forming the first thing on earth that could possibly be called a cornea. This cornea, I believe, was at first opaque; for Nature has always proceeded by trial, error, and rectification. And it is a fact that some of the worms and snails have just such opaque corneas to this day, e. g., the snail called Limax maximus. In a few species of snails the closing membrane can even

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be seen not quite crossing over. Nature, however, seeing her mistake, eventually rectified it, making most corneas both continuous and transparent.

According to the law of variation, or mutation, some of these transparent corneas had to be different from other corneas. Some individual corneas, therefore, were no doubt thicker in the center than at the circumference. And behold there had come into the world, lenses. These were not true crystalline lenses but only corneal lenses, yet we can easily imagine that the possessor of such lenses, because it received through them some kind of picture, however dim, of the outer world, had a very great advantage over many other animals in "the struggle for existence." Double-convex corneas therefore multiplied throughout the world.

After a time the cornea in some way began to form its double-convex lens wholly upon its posterior surface by a process of sacculation. Then it went much further and even began pinching-in around the edge of that sac-like lens, between it and the cornea, and thus, after a time, the lens became detached from the cornea and also became suspended from the walls of the eye-ball by a structure called "the suspensory ligament."

That whole process is recapitulated today in the human unborn child. At first there is in the child a cornea and no lens. Then the cornea sacculates backward at its center. Finally this lens, so formed, is "pinched off" to constitute a detached lens, one which hangs by a "suspensory" ligament directly in the light-path and just behind the pupil.

This brings us to a discussion of the eyes of insects, the last of the invertebrate eyes that I shall mention. I am, as a matter of course, passing by a great many eyes of much interest and even of much greater complexity than those I have mentioned. I am simply moving up what I conceive to be the central trunk of the eye-development tree and paying little attention to the lateral branches, howsoever important these may be.

Insects' eyes are of two kinds: simple and compound. We may take as typical examples the simple and the compound eyes of the ordinary house-fly. If one looks at a common house-fly one sees, even with the naked eyes, that the fly's head consists almost entirely of two

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large, dark-brown lobes, the compound eyes, each eye a truly wonderful affair. Each consists of more than 4000 eye-units, called *ommatidia*, placed side by side. Each eye-unit is hexagonal in circumference like a single cell of honey. At one end of each long, cylindrical, hexagonal eye-unit there is placed a bit of pigment—retina, rather—for each bit of pigment is now connected with the central nervous system by means of a tiny nerve fiber or miniature optic nerve. The outer end of each eye-unit has a cornea. In its center this cornea is thicker than at its hexagonal circumference, making of each cornea a double-convex lens. And each double-convex lens, or cornea, throws its own tiny image of a small part of the outer world upon its corresponding retinula, or speck of retina. There is then conveyed to the fly's central nervous system from each compound eye a mosaic picture, a picture compounded, naturally, of more than 4000 minute picture-fragments.

These are the fly's compound eyes, two in number. But it has also three single eyes, situated, in the form of a triangle with its sharpest point downward, in the space above and between the compound eyes.

Thus far I have said nothing about the focusing of eyes for various distances. Nature gave two kinds of eyes to the fly because she had felt the need for focusing, or the adjustment of eyes for different distances. She did not, however, at first think of a very good way to accomplish this adjustment and made for the fly two kinds of eyes: the compound eyes for distance, i. e., a distance of three to four yards, and the single eyes for near vision, "near" meaning, in the fly's case, from one to two inches. Some insects have only compound eyes. Some have only single eyes. Most of them have both single eyes and compound. And none of these insect eyes have any movements. The eyes are set on the fly's head as solid as so many jewels in a watch. There are, however, in some of the invertebrates (animals without backbones) eyes that move, as, for example, the snail's eyes, but that is because the snail's eyes are placed on the ends of two long antennæ. But in no invertebrate, so far as I am aware, is there even a rudiment of an eyelid. Neither is there any true iris or pupil.

Leaving the invertebrates and coming to the great backboned class of animals, the first of which are the fishes, a great improvement in eyes is evident at once. But how the fish got their immensely im-

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proved eyes is difficult to say. Some people believe that the eyes of fishes are directly derived from the eyes of some of the invertebrates, possibly the insects or the worms, marine worms. Others say, "No," because, in practically all invertebrates, the rods of the retina are turned in the opposite way from that in which they are turned in all the backboned things. Others again say that, inasmuch as six out of a spider's eight eyes have the retinal rods turned like those of the human eyes, the vertebrates are therefore all descended from the spiders or at least from some kind of arachnid. Still others say that vertebrates did not inherit their eyes from the invertebrates at all but that they started the development of eyes all over, made a fresh beginning. In proof of this they cite the Amphioxus with its pigment eyes. The Amphioxus has a notochord though no true vertebral column. It is something which is trying to become a vertebrate yet which does not quite succeed and seems to be the immediate ancestor of the fish. At all events some people think that eyes started all over with the Amphioxus on an entirely new and better plan. But some comparative ophthalmologists point out that the Amphioxus' eyes are not beginning-eyes at all but degenerate eyes, that is, eyes that have fallen from a better state because of the Amphioxus' habit of burrowing and even living in dark ooze and wet, sharp sand. Consequently these eyes are not making a beginning of any sort but only an ending. In other words, eyes, like other organs, can undergo involution, or degeneration, as well as evolution, or improvement. Then there are still other thinkers who say that eyes did indeed begin all over with the Amphioxus but that this later scale or ladder of eye development started not with the Amphioxus' pigment, or degenerate, eyes, but with certain spinal visual cells which, in the primitive (transparent) Amphioxus, lie all along the spinal column and are sensitive to light. As the Amphioxus became less transparent in some of its species and grew more like a fish, its spinal visual cells moved to the surface of the body and became, two of them at least, true vertebrate eyes. Still other persons declare that the eyes of vertebrates are not descended either from pigment eyes or from spinal eyes but from tactile corpuscles in the skin of some of the most primitive backboned animals. We see this sort of thing going on (the development of eyes from skin) even at this very day—on the back of the Onchidium—numbering from 12 to 82 eyes in each individual's back-

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skin. Whatever the truth among these theories may be one thing stands out clearly and that is that the subject of eye-development becomes, as we pass from the invertebrates to the fishes, one of great complexity and obscurity.

And now the eyes of fishes. Of a sudden all is changed. People are accustomed to say, ridiculously, "The poor fish." But the fishes have presented to the world many fine matters of inheritance—for one thing, the backbone itself. As if this wondrous gift were not alone sufficient, the fishes introduced also a true crystalline lens, not a merely corneal lens but a lens posterior to the cornea, pinched off from it in the course of its embryology and separated from it by transparent fluid. They also introduced true focusing arrangements. In addition they gave us the iris and the pupil, also muscles with which to move eyes in their sockets, and they almost, but not quite, introduced eyelids.

And now, in order to bring out clearly the importance of eyelids, I shall have to run forward for a moment to the eyes of men. This importance is owing chiefly to the need for retinal rest. Retinal rest, in men, is secured chiefly in two ways: by motion blindness and by involuntary winking.

Whenever our eyes are in motion they are stone blind, excepting only when they move without changing the point at which they look. Astounding as is this fact it is hardly ever borne in mind, even by ophthalmologists. Yet any one can easily convince himself of the truth of the statement. Let him stand before a mirror and look at the image of one of his eyes. Let him look first at the right side of that eye, then at the left side of the same eye, and then back again. Never, so long as he lives, will he see his eye in motion. The reason is that, just so soon as an eye begins to move, it is blind. We are never conscious of the blind interval, partly because the picture which is last seen before the eye begins moving persists in the sight-center of the brain and thus laps a little over the interval during which the retina is blind. But the chief fact is that the retina, by means of its motion blindness, gets minute intervals of rest with very great frequency all through our waking hours. In this way, too, the blurry and therefore useless pictures which we should receive if the eyes saw while in motion are avoided.

But there is yet another way in which retinal rest is secured:

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namely, by the involuntary winking of the lids. From three to six times a minute this involuntary winking takes place, very much adding to the quantity of rest which the retina receives.

There are other uses of eyelids: protection against injuries by foreign bodies; the frequent spreading of the tear (which is continuously secreted at the upper and outer angle of the eye) in a thin layer across the front of the eye to keep the eye clean, moist, and bright; and the moving of the tear on to the mouth of the tear sewer, which begins at the inner angle of the eye and runs down into the nose.

There were no eyelids in the world before fish, and fish simply made a beginning of eyelids. To this day no fish has a functioning upper or lower eyelid. In a very few species there do exist fixed skinfolds above and below, and in some sharks there is a "membrana nictitans" or eyelid in the inner corner of the eye. This is really a functioning lid. By the contraction of its muscles it is moved outward across the front of the eyeball and back to the inner corner of the eye. A vestige of this membrana nictitans, the chief functioning eyelid of snakes and birds, still remains in the human eye.

The eyes of fishes may be classified according to the depth of the water their possessors inhabit. Because they live in fairly well illumined water fish that live in the uppermost layers of the sea have pretty good eyes. Those that live in deeper and deeper water have increasingly larger and larger eyes, with larger and larger pupils, in order to catch what little light is stirring about them. These eyes are also nearer the top of the head because the light which they do get comes from above. At length, in the very deepest depths, where no light ever is found except, perchance, some mysterious bit of phosphorescence, the eyes become smaller and smaller. Finally, in the blackest abysses of the sea, eyes generally become mere rudiments or disappear altogether. Fish, too, that live in dark caves are totally blind, some even eyeless.

And here, because of an extremely important and new subject, I am going to digress a little. Blind cave-dwelling animals of various sorts have recently been made to see. Professor Przibram, of Vienna, in an artificial cave bred successive generations of the blind, cave-dwelling amphibian, Proteus. By exposure to red light he developed, in the very first generation, the perfectly solid, pin-head sized, perfectly blind eyes of Proteus into large and fairly well functioning

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organs. No other kind of light than red would do the work. Exposure, moreover, even to the red light, of the adult Proteus gave no results.

But to return to the fishes, I shall take as typical the eyes of fish living in well lighted water. These eyes are all short-sighted because even in the best lighted water no eyes can see very far. A fish's cornea is always flat (which tends to make the eye *far*-sighted) because any convexity it might possess would be completely nullified by the water fitting round it, since water has substantially the same index of refraction (power to bend light to make pictures) as the cornea. Moreover, flatness of cornea is an advantage because a flat cornea is not so easily injured as a prominent one and nearly all fish have no protection from eyelids. To offset the flatness of the cornea there is a spherical lens, with a high index of refraction, which more than overcomes the far-sight of the cornea and actually makes the fish to some extent short-sighted, which is precisely the condition he needs.

Fish are about all color-blind. Tell this to a fisherman with his brightly colored flies, and he will laugh derisively; nevertheless it is a demonstrable fact.* Fish can distinguish between the different colors but they do not see them as colors—only as various shades of gray, precisely as a color-blind person would. Fish have also a very restricted visual field, scarcely seeing anything below their head level.

I have said that fish introduced accommodation into eyes, *i.e.*, a

* Zolotnotsky, in 1901, made the following false experiment. For a long time he fed certain fish, which were kept in an aquarium, with maggots of a dark red color. He then fastened inside the aquarium wall woolen imitations of these maggots, but of white, green, yellow, and red. The fish paid no attention at all to the white and green, hesitated a little before the yellow, but darted immediately at the red and ate them greedily. From this experiment Zolotnotsky concluded that fishes have color sense. The experiment was about on a par, in the matter of scientific accuracy, with the careless observations which some people make when fishing.

A few years after Zolotnotsky's experiment, a long series of very careful experiments on the color sense of fishes was made by Hess. It was well known to Hess that a completely color-blind human being easily learns to tell colors apart and even to name them as normal persons do, simply by noting the difference in the illumination, or relative quantities of light given off by objects of various colors under the same brightness of light. (Black and white are not, in this connection, regarded as colors; neither are grays, which are simply mixtures of black and white.) That is to say, to a totally color-blind person white looks white and black looks black; also gray (any mixture of black and white) looks gray. And all the various colors look gray to him also. Green, for example, looks a very light gray; yellow, a gray of medium darkness; and red, a very dark gray, almost a black. For this reason it is that, when examining railroad men, lighthouse keepers, and so forth, for color blindness, we must be exceedingly careful or we shall make serious mistakes. Hess, keeping in mind these things, conducted his experiments with very great accuracy. And they all lead without one single exception to the same conclusion —namely, that fish have no color sense.

Here are some of the simpler experiments. A red bait and a dark gray bait (which to a totally color-blind person look exactly alike) were fastened at intervals about the aquarium walls and all were equally illuminated as well as provided with exactly the same backgrounds. The fishes swam to and ate both kinds of bait, red and dark gray, indifferently. Again, a series of gray baits only, ranging from very bright grays to very dull grays, were fastened to the aquarium walls and the fish were once more permitted to enter the aquarium. They all swam to the dark-gray baits and ate them immediately, leaving unnoticed the lighter grays. It was, therefore, the intensity of the illumination reflected from the baits (not shed upon them) and not color sense at all which had guided the fishes.

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focusing apparatus. Their focusing is done in several ways but chiefly by a band of contractile tissue running from the end of the optic nerve in the back of the eye forward to the posterior surface of the lens. This band is called the "falciform process." When it contracts it pulls the lens back nearer the retina, thus focusing the eye for distant objects. When it lets go it permits the lens, by virtue of its elastic attachments, to run forward again. One may, from these facts, see that the fish's eye is at rest when focused for near vision but that it is engaged in active muscular contraction when looking at a distance. This is just the reverse of the situation in our own eyes, which are working hardest when looking at near objects.

And I must say at this juncture that, in human eyes, the focusing muscle is not like that of a fish—*i.e.*, a longitudinal muscle running from the back of the eyeball forward to the back of the lens—but that it is circular in form, running all around the circumference of the lens next the wall of the eye. When this muscle contracts the lens bulges (becomes more convex) on its front and back surfaces and in that way changes the eye's focus from far to near.

The falciform process (focusing muscle in fishes) should have a great interest for everybody. In amphibians, reptiles, and birds it has lost its attachment to the posterior surface of the lens but retained its attachment to the optic disc, and in these classes of animals it is called "the pecten." In many snakes it has disappeared altogether. It does not occur in human beings, except in extremely few cases in the form of what is called "the persistent hyaloid artery." This artery in the last few weeks of fetal life almost always shrinks and disappears. But sometimes it persists and then it is seen by the ophthalmologist, through an instrument with which he looks into the interior of the eye, as a thin, gray, vascular cord, running from nerve-head to posterior surface of lens, exactly in the path of the old focusing band or "falciform process" of the fish. Sometimes it presents a number of loose, grayish tags, or flaps. The vision in these cases may be normal but often it is low. One can hardly understand the persistent hyaloid artery without some knowledge of the fish's eye; and one is also obliged to speculate, in view of the remarkable results of Przibram with the undeveloped eye of cave animals, as to what the effect of continued exposure of an eye with persistent hyaloid artery to spectrum red light would be.

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Fishes also introduced into the world the iris (the colored ring seen in the front of every human eye—blue, gray, brown, or black, as the case may be) and the pupil, which is simply the black spot, or light-hole, in the center of the iris. The pupils of all fishes are declared by some observers to be oval, but I have never found one single fish's pupil that was. They are all round, except a very few unusual ones, and these are not oval. The pupil of a dead fish is round as a matter of course. Even a cat's pupil, which is long and vertical, when contracted, for looking up and down trees, is perfectly round in low illumination and when its owner is excited or dead. But practically all the fishes' eyes that I have examined have had round pupils, even in strong light, and these pupils, by the way, have had only a little "light-reflex" (spontaneous contraction of the pupil in the light and dilatation in the darkness).

Before the fish there were no muscles to move eyes around in their sockets. In some of the molluscs and arthropods eyes were set on eye-stalks and these stalks were movable. But there were no eye-muscles proper, muscles, that is, to move eyes in their sockets. Now, in many fish, there are muscles that move the eyes in their sockets, though only to a comparatively slight extent.

There are fishes with thermometer eyes and fishes with incandescent eyes which illuminate the sea so that the seeing kinds of eyes of the same animal may have vision. Inside some fishes' eyes is a wonderful reflector just like that in the cat, dog, deer, and so forth—animals whose eyes are generally known to shine in the dark. A fish's eye shines in the dark, both because of the light reflected from the interior of the eye and also because of the light reflected from the anterior surface of the iris. In the cat, dog, lion, and so on the reflection is only from the interior of the eye.

Had I the time I would describe the eyes of many peculiar fish: those of the Anableps tetrophthalmus, for example, which have, each, two pupils, one for seeing in water, the other for seeing in air; of the pleuronectidæ: flounders, and so on. These eyes, in the fish's youth, lie, in the usual way, one on each side of the head. But, as the animal grows older it swims only along the bottom of its habitat, constantly scraping the gravel and sand with one side of its head, and thus its skull twists until the two eyes lie on one and the same side of the head—the upper. This statement can easily be corroborated

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in almost any fish market. All the pleuronectidæ, or side-swimmers, have such eyes. In one species the eye which shifts does not pass round the skull but actually goes straight through it, as the fish grows up, till it comes to lie in identically the same socket as the other or non-migrating eye.

The next great class of eyes is that of the amphibians. These developed from those fishes that had lungs, the dipnoi. The fishes with lungs could breath either in air or in water and consequently they often flopped out on the land and, in time, at least some of them learned to live there. So life passed from water to land. The pectoral fins became shoulders and arms, the ventral fins became hips and legs. The scales that covered the body were lost, the skin becoming naked. The resultant beings, called amphibians, are higher in the scale of life than are the fishes. To them we owe a number of important inheritances, one of the very greatest, of course, being the transition from aquatic to terrestrial life. This transition is still not complete, even in ourselves, for every embryo child at a certain stage of its development has gills just as surely as the tadpole, the water stage of the frog, has gills. Another gift of the amphibians is the thumb, without which there never could have been a human hand. Look at the hand of the frog today with its little, human-like "opponens." To Mr. Frog, or Mr. Frog-like, the world owes vocal cords and speech.

The amphibians developed the eyelids further than the fishes had done, especially the lower eyelid. But whereas we human beings wink with the upper lid downwards the frog winks with his lower lid upwards.

Few fishes have any tear apparatus, for wet eyes need no tears. When they do have a tear apparatus it secretes not tears but fat. The amphibians, however, presented the world with true lachrymal secretion and drainage.

Some of the amphibians had a median, or pineal, eye, that is, an eye in the back of the head. Many of the gigantic saurians, too, of Mesozoic time had this eye and in any geological museum one can still see, in the back of the giant lizard's skull, the hole through which this strange eye formerly looked out. In ourselves the hole has boned over and the eye has shrunk up into the so-called pineal gland. (But this, once more, is eye-involution, not eye-evolution proper.) In the

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present-day hatteria, of New Zealand, this eye is present early in life and is almost a functioning eye, for lens, retina, pigment, cornea, are all present. But the eye degenerates as the animal matures. In the present-day chameleon the pineal gland still projects through the skull and is covered by transparent skin.

Many of the amphibians have fair color vision, but, as in the case of the fish, none has a retinal sharp spot, or macula lutea; and, partly for this reason, their sight is in general poor.

The reptilia added little to eyes. A curious fact is that many persons, even scientists, believe that snakes have no eyelids. The truth is that the snake has, in addition to the membrana nictitans (third eyelid), both an upper and a lower eyelid. But these lids are fused together and are perfectly transparent, so that they form in effect over the front of the eye an immobile transparency often called by naturalists "the scale" or "the crystalline scale." This is simply a transparent duplex eyelid or storm-window for the snake's real eye. Being extremely hard it protects the eye from scratches as its owner glides along among thorns, briars, sharp sand, and so on. At the skin-shedding (annual, twice-annual, or thrice-annual, according to circumstances and the species) the scale is shed with the rest of the skin. Just before the shedding the scale becomes opaque and the animal is, as country people all know, blind at that time.

Snakes have no spot for central (sharpest) vision in their retinas and in general they have very poor sight. Most of them see hardly anything except objects in motion. Most snakes are nearly deaf too, so that their knowledge of the outer world reaches them largely by way of the little forked tongue, which is probably the most wonderful tactile organ in existence. This little affair is almost constantly out—feeling, feeling myriads of vibrations in the atmosphere which, to our coarse sense of touch, are as if non-existent.

From the hideous reptiles branched off both the mammals and the birds: which was the earlier, we do not know.

As a matter of convenience, I shall first consider the mammals or those animals which suckle their young. These may be classified as non-primates and primates, the primates including monkeys, apes, and men. There are no distinct maculæ luteæ (spots of central, or sharpest, vision) in the retinas of any of the non-primates. Many of

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these have no maculæ at all. Scarcely any of them have any overlapping of the visual fields of the two eyes and those which do have some overlapping have no true stereoscopic vision—vision with depth and relief in it. Hares and rabbits actually have the fields overlapping behind their heads (behind, because these animals are not hunters, but hunted), yet they have no stereoscopic vision. In nearly all the non-primates, too, the eyes are not set out on the front of the face but at the side of the head; and the human fœtus in its earlier stages has its eyes so placed, thus helping to recapitulate the story of its undoubtedly animal ancestry. Most of the visual fields in the non-primates are very narrow and the range of movement of eye in socket is slight, sometimes negligible.

A very great difference exists among mammals in the shape of the pupil when in the contracted condition. Practically all pupils when dilated, whether from emotions or from the dark or from drugs or death, are round. The pupils of nearly all the ungulata, or hoofed animals, are, however, broad horizontally, even when dilated. A goat's pupil is very long horizontally even when dilated to the utmost. Atropine and excitement combined could not increase the vertical diameter of a goat's eye which I examined to more than one-third the horizontal diameter. In the contracted condition, though, the pupils of not a few animals vary greatly from the round form. Thus the pupil of the domestic cat, when contracted, is vertical, very narrow, and with quite sharp angles above and below. The cat's pupil, in fact, can get so narrow horizontally that it actually ceases to exist at all. Moreover, a cat whose eyes I used to examine a good deal had the very obvious power of contracting and dilating her pupils at will, just like a bird. Whenever I stroked this cat she would purr rhythmically, now and then omitting one single purr, and in place of the purr substituting a complete obliteration of her pupils, followed by a moderate dilation of them. She would then resume the purring, keeping, all the while, very good musical time. The cat, of course, needs a vertical pupil for the purpose of hunting its prey up and down trees. There is a popular impression that all the felidæ (cat family) have vertical pupils. But this is a mistake. Even in contraction the lion and all the larger felidæ have round pupils. The horse's pupils are very peculiar. They are wide horizontally in order that the animal, when grazing, can see sidewise, both to right and to

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left, over a wide expanse of ground. Near the center of the upper border of the pupil and again near the center of the lower border of the pupil are seen, attached to the iris, a number of small black bodies called "corpora nigra." In strong light these bodies, moving from above and from below, serrate into one another, like saw teeth, thus obliterating the central part of the pupil entirely and leaving two round pupils, one at each end of the horizontal diameter of the eye. The horse's eyes are placed prominently up and out on the corners of its head so that it can, in fact, aim a kick at a wolf—the horse's natural enemy—without turning the head.

The back of the eye, as observed through the pupil, is called "the fundus." The fundus of the non-primate eye is simply a marvel for its vast variety of ophthalmoscopic appearances. A day in the zoo with an ophthalmoscope (an instrument for illuminating and looking inside of the eye through the pupil) will prove an event in the lives of most scientists. Nor, strange to say, are very many animals averse to the use on their eyes of that instrument of investigation. Some indeed, particularly birds, are promptly hypnotized by its light and become quite tractable, cooing and cooing with great affection during all the exploration of the interior of their eyes.

In all the felidæ and some of the other non-primates there is a "tapetum lucidum," or light-reflector, inside of the eye at its back, and it is this tapetum which makes the eyes of such animals "shine in the dark." The tapetum lucidum first appeared in the fish, only, in the fish, the tapetum covers the entire rear part of the inside of the eye and then, passing round anteriorly to the front of the eye, forms there the anterior layer of the iris—what is known as the "argentea," or silver membrane. In other words, the fish's eye reflects light from the anterior surface of the iris as well as from the entire interior; while in the felidæ and indeed in all the other mammals whose eyes shine in the dark there is no reflection from the anterior surface of the iris but only from the interior of the eye and, further, only from the central part of that interior. Take, for instance, a dog's eye. The central part of the tapetum lucidum, viewed with an ophthalmoscope, shines with a yellowish luster more bright and beautiful than that of beaten gold. Round this is a green area, also unspeakably brilliant. Then comes, most peripheral of all, a

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dark zone known as the "tapetum nigrum," or black carpet. This reflects no light, and, furthermore, it is partly or wholly blind.

All eyes that shine in the dark do so by virtue of their tapetum lucidum, or concave reflector, behind the retina (that sensitive plate) which is always, in health, transparent. The purpose is to enable the animal to see better in the dark. The little light that is stirring in the outer world enters the pupil, passes through the transparent retina, and on to the tapetum lucidum. The retina utilizes this light for vision as it passes through that membrane. It utilizes it again, since the same light is reflected from the tapetum out through the retina, then through the pupil, and on into the outer world, where it falls on the same object from which it came. Here it is joined to the fresh, original light, coming once again from the object, once more it enters the eye, and so on. Each and every ray is in fact utilized until it has been completely absorbed, or stopped, by its frequently repeated transmission through the various media—atmosphere, cornea, aqueous humor, and so on. And thus the carnivora and some other animals, whose vision is very much poorer than ours by day, have vision much better than ours by night. And that is why, as Treacher Collins has admirably pointed out, primitive man lived in great terror of the dark. He was eater by day, eaten by night. And this is one reason why human children, even to the present moment, dread the dark instinctively and often terribly. It is also the reason why, for long ages, the human race lived, by night, in caves or in lake dwellings.

Most people suppose that only the carnivora have eyes that shine in the dark. But many other animals have such eyes. The eyes of the horse, for example, are not infrequently seen to emit in the dark a bluish scintillation. This always comes from the upper part of the horse's fundus. An ophthalmoscope reveals that at the upper part of the fundus there is a tapetum lucidum. The lower part is, strangely,

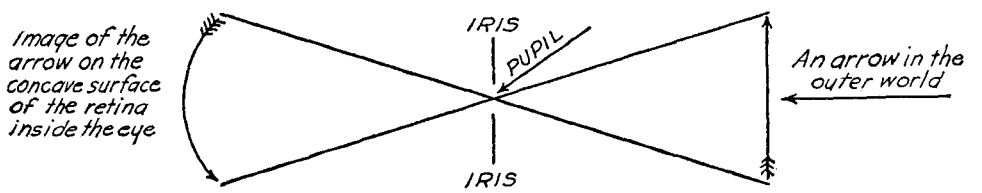

Diagram showing why the upper part of the retina of any animal that has a pupil necessarily receives the image of the lower part of the external world, and *vice versa*.

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covered with a dark tapetum nigrum and is practically blind. (The upper part of a retina sees the lower part of the external world and *vice versa*, because of the crossing of the light-rays which necessarily occurs in the pupil.) The consequence is that the horse sees almost nothing situated above the level of its eyes, as I have often demonstrated; while on the other hand a horse can see the road, even on a dark night, vastly better than can any human being.

For countless ages the horse's eyes, set out prominently on the corners of his head, have been exposed (on the great plains) to the effulgence of the sky and the sun, and consequently the lower part of his retina—the part that sees the sky—has been completely burned out. On the other hand he has always been a runner and grazer and therefore has needed to see the ground well, and in consequence he has developed, in the upper part of his eye-ground, much the same kind of structure as the carnivora possess in the central part of their eye-grounds.

In every human eye there is a tapetum lucidum, or reflector, but it is a rudimentary organ, one that has undergone involution and that reflects little light.

A few words, now, about the primates—monkeys, apes, and men. The eyes of the galago (one of the lowest monkeys, or pro-simiæ) are very instructive indeed. These eyes have "retinitis pigmentosa" normally—a certain very serious disease not infrequently appearing in human beings. Since the galago almost certainly occupies a conspicuous place in man's pedigree, it is more than likely that retinitis pigmentosa, in the human being, is simply a degeneration or reversion to this old type of ancestral eye. I have heard ophthalmologists say that retinitis pigmentosa is almost always the result of inherited syphilis. I cannot agree further than that I admit that, in inherited syphilis, there is a strong tendency toward reversions of various sorts. There is the same tendency too in the children of consanguineous marriages and in twins and triplets from marriages of any sort.

Zoologists have found that the galago is a dark-loving animal and that, if it be forced to dwell in strong light, its sight rapidly diminishes until in a few years the vision is entirely gone, whereas if the animal be allowed to continue living in the low illumination which is normal for it, it will keep the sight with which it was born. Moved by this fact, and believing retinitis pigmentosa to be a reversion to

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this old type of eye, I have long caused my patients suffering from retinitis pigmentosa to avoid all strong light with the utmost care and to wear one or another of our modern absorptive lenses.

The pupils of all the primates are round. These eyes, too, are placed less on the sides and more on the fronts of the heads than is the case in the non-primates. There are also spots of central (sharpest) vision in all these eyes and strong muscles of "accommodation" (focusing). In all the monkeys the eyes, just as in men, can both be converged on the same point and stereoscopic vision thus obtained—but not very long maintained. In the apes stereoscopic vision is more easily reached and maintained with less effort. But only in man, of all the mammals, does there seem to be continuous, easily kept, binocular and stereoscopic vision. Even in the human child, however, the eyes do not as a rule move in perfect unison with each other till about three months after birth, because stereoscopic vision, in the history of life on this planet, is an extremely recent appearance. The same fact explains the ready loss-of-binocularity (cross-eyes) in many persons as the result of optical errors (eye-strain). Then, as to the light-reflex—the power of the pupil to expand spontaneously in the darkness and to grow smaller in the light—even in some of the fishes there was some slight pupillary response to light. That is why the human infant has a good light-reflex even at birth. This light-reflex inheritance has come a long way and is therefore much better established than the power to use the two eyes together.

I should add that the eye-grounds of all monkeys and apes are almost exactly the same as those of the black race of mankind. There is the same dark chocolate hue of the choroid (a membrane situated behind the retina), the same shot-silk appearance of the retina, etc.

One peculiar thing about man's eyes, dominancy and serviency, is not found at all in the eyes of animals. In all mammals the eyes are *two* little cameras, not just one. In each of these cameras there is produced a tiny picture of the outer world. But in the brain of a man only one, single, composite or stereoscopic picture is seen. And the peculiar thing about the vision of a man is that to the formation of this single stereoscopic picture in the brain the two pictures, one in each eye, do not contribute equally. In a right-handed person the right eye nearly always contributes most of the picture: in myself about 95 per cent, in my wife about 100 per cent, under all ordinary

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circumstances. In a left-handed person the left eye nearly always contributes the most of the picture. In other words the right eye is almost invariably the window the brain really looks out through, even when both eyes are directed at exactly the same object, and when the sharpness of sight of both eyes is exactly the same. The right eye gives to the brain the details of the outer world, the left eye just coming in now and then with a little accessory information as to certain matters. In some persons the servient eye has no vision, when both eyes are in use, except central vision, or upper- or lower- or right- or left-half-vision. In all these cases when the right eye is closed the left eye promptly extends its visual fields to the normal limits of the right eye. I have long experimented with these matters and hope some day to make a complete report. Meanwhile, to test whether or not human beings have or have not dominancy and serviency in their eyes, just ask some friend to look at a tiny spot on a wall at a distance of some feet. Then say, "Now, while you still keep looking at that spot, take off your finger-ring and hold it up where you will be looking through it." The friend, having removed her ring, will, if still looking at the wall-spot, hold the ring up till she perceives that she is looking through it. Then ask her to close her left eye and to tell you whether she still sees the spot through the ring. If she be right-handed she will almost certainly answer, "Yes, I still see the spot through the ring." Next ask her to open her left eye and to close her right one and then, while looking at the wall-spot with her left, to say just where she is seeing the spot, whether inside or outside of the ring. She will, of course, if right-handed, answer "Outside the ring." If she be left-handed, her answers will be exactly reversed.

Dominancy and serviency in eyes, like right-handedness and left-handedness, have come into the world very late, that is, as a consequence of the evolution of a speech-center. A right-handed and right-eyed person always has his speech-center on the left side, and, generally, possibly always, the converse is true. In no animal, so far as I have been able to learn, is there any such thing as handedness or eye-dominancy. This is a peculiar state of affairs. Man did not much more than develop binocularity and stereoscopic vision than he proceeded, through the development of a speech-center, to lose the stereoscopic vision very largely, though not the binocularity. This keeping of binocularity (the pointing always at the same spot in the outer

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world by the two eyes) at the same time with the steady loss of stereoscopicity (the *seeing* of the same spot by the two eyes simultaneously) is producing in the human subject a condition which, however much it is being ignored, will eventually and necessarily result in consequences of vast importance. Biologists not infrequently tell us that in man evolution has already come to a full stop, that man and his organs have become too highly specialized ever to change any further. But that I believe to be a great mistake.

Of the eyes of birds I have time to say little. Birds, I believe, do not stand in the line of man's ancestry at all. Birds' eyes, nevertheless, are the finest and most remarkable of all the eyes on earth, being often both telescopic and microscopic—as man's, of course, are not. In birds the focusing organ is chiefly the cornea, not the lens. In birds, too, the visual acuity is almost incredible, being, in some instances, one hundred times as great as that in men. A bit of grain or a tiny insect which human eyes can barely see at a distance of one yard, these birds can, as I have often demonstrated,* see readily and distinctly at a distance of a hundred yards. This remarkable visual acuity in birds is almost a necessity because, since the olfactory passages are encased in horn, the sense of smell in birds is exceedingly poor. Even vultures, contrary to popular supposition, do not smell their food, even though it be carrion, but see it.

Birds do not see blues and violets at all. This helps in their distance vision because the haze which hangs about distant objects and which, for our eyes, renders them more or less invisible, for birds does not exist. Birds, on the other hand, see infra-red radiations which, for us, affect only the temperature sense of the skin and not the retinas.

Certain other characteristics are peculiar to birds' eyes, one being the voluntary control they exercise over the size of their pupils, as Casey Wood has pointed out and as any one can see. Whether contracted or dilated, a bird's pupils are round, except in a very few species, e. g., the owl, which is a tree-hunter like the cat. Nearly all birds have eyes on the sides of the head. Such birds, of course, can have no binocular vision. Many nevertheless possess stereoscopic vision which they get by virtue of the fact that they have two maculæ (spots of sharpest vision) in each eye. This gives in the one eye the two

* See, for example, *Bird Lore*, Vol. XXXI, No. 4, July-August, 1929, page 249, my article, "Birds' Eyes."

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pictures from two different angles which constitutes the *sine qua non* for stereoscopic vision. I have never seen or heard of bloodvessels in the retina of any bird. This absence of vessels greatly helps to sharpen the bird's sight because bloodvessels ramifying in the substance of the retina, as they do in ours, interfere very much with visual acuity.

And thus, at least up to the present moment, in the visual apparatus of birds the actual climax of eye-evolution has been reached. These animals, it is true, cannot rationalize about the earth and the sun as can we, and yet they do indeed behold "the child of the sun" as we can never hope to see it and they can also gaze back—some of them, at least—upon the parent sun itself without injury, without pain, and with a sense of glorious effulgence we can never understand.

Thus the evolution of eyes, as shown forth by the eyes existing in the world today, runs the entire gamut from the mere generalized light-sense of the ameba to the literally superhuman eyes of birds. In other words some eyes have stood quite still and never progressed an iota since the beginning of the generalized light-sense. Others have moved forward incredible distances. Between these two extremes stand the eyes which, to us, are of the greatest interest and importance of all—those of man. Are these eyes standing still? Or are they receding, like the eyes of animals entrapped by circumstances in dark caves—the blind cave-fish, for example, in Kentucky? Or are they improving, and if so, how? Many biologists, as already stated, say that man has become so highly specialized an animal that now he can change no further, not even in the slightest respect. That is an opinion common today among biologists. Highly generalized animals, they say, undergo evolution very easily, highly specialized animals not at all. And yet the relevant facts, I believe, clearly do not support such a view. Surely, for example, the ameba is not a highly specialized animal. Yet there live upon the planet at the moment of this writing countless trillions of amebæ which, though not a single part of them has ever been specialized to a degree worth mentioning, present themselves today precisely as they were when animal life on this planet had its origin. Upon the other hand man and his eyes are plainly changing. Man in general, with many of his organs besides his eyes in very plain process of change, is undergoing significant modification. His teeth, for one thing, are evolving away. So also are his ton-

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sils. So is his vermiform appendix. So is his gall-bladder. His arms are getting shorter and his legs longer. His hands and his brain are getting larger and stronger.

His eyes present far greater changes still. The greatest evolution of the human eye which has of late taken place has been, of course, the development of marvelous artificial accessories to that organ. In other words, evolution of the fleshly eye has been, for man, in the more recent stages of his progress, too slow. His fleshly eye might, in the course of long ages, have become both microscopic and telescopic, like a bird's. But man, being an impatient animal, could not wait. Consequently he invented the microscope and the telescope. He also invented the spectroscope, the X-ray apparatus which permits him to see through opaque objects, and numerous other optical instruments. And the beginning is hardly as yet!

But what about the human eye itself, as distinguished from artificial accessories? Is not the organ itself to develop still further? If so, in what ways? It is a well known fact that the human eye is at rest when gazing at a distance but very hard at work (especially at work focusing) when looking at near objects. This is the exact opposite of the situation in the case of many birds and of all fishes. And, until two or three generations ago, it was, no doubt, a very great advantage for man to have eyes which are at rest when looking in the distance, for man, during nearly all his time, was engaged in looking far away, hunting for something to kill and eat. In the last three generations, however, book education has become almost universal, and man is now not so much a distance-looking as a near-looking animal. He reads, writes, repairs watches, cuts gems, examines pictures, and so forth. Nature has sought valiantly, in two very different ways, one bad, one good, to help his eyes adjust themselves to the new set of conditions. The bad way has been to make him near-sighted. The near-sighted eye is at rest when looking at near objects, but always it is a diseased eye. Moreover, it sees poorly at a distance (often at close range also) except when fitted with lenses. And it not infrequently goes blind from internal hemorrhage and detachment of the sensitive plate, or retina. The good method used by nature to help man in his modern conditions of existence has been the strengthening of his focusing apparatus for near points: chiefly, that is, the improvement of the elasticity of the lens. It is, I am firmly convinced,

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the normal-sighted eye, supplied with a very strongly developed focusing apparatus for near objects, which will survive the competition between the two kinds of eyes.

Later the falciform process or something similar to it may be redeveloped. Man then will have "negative" accommodation. I also feel that in the course of generations man's "field" of view will become smaller and smaller, this because his need of a wide field is growing less and less. I even believe that in the course of countless ages the two human eyes will come closer and closer together, the bridge of the nose will further diminish and sink (just as the animal snout, in man's line of descent, has been doing for æons of time) and finally that man's two eyes will again become one—just one large, central, cyclopean eye. It is likely that the merely servient (left) eye will shrink away (as the pineal eye has already done) so that the right eye will become the cyclopean. Certain it is that the left eye, even today, is being used less and less continually. Man's binocular and stereoscopic visions are being destroyed—the price he pays for his speech center. The great cyclopean eye, however, will regain stereoscopic vision by developing two maculæ in the one eye, just in the fashion in which many birds have stereoscopic vision in each eye now. Although the field of view will then be narrower than now the eye will probably be both microscopic and telescopic; it will be exceedingly acute for colors, for motion, and for form; and, finally, most important of all, it will probably be able to perceive as light many forms of energy which now produce in human eyes no sort or kind of perception.

Yes, in distant centuries or millenaries man will be a cyclops, a Polyphemus, a being with one eye only. That eye, however, will not be situated in the center of the forehead. It will stand instead in the center of the face. The forehead will be much higher and the face-below-the-forehead much shorter and, at the horizontal boundary between the two, in the center of that boundary, the spot where now the bridge of the nose appears, there will stand the one great eye.

That eye will gaze forth on a very different world from that which men see today, and for two chief reasons: the one cyclopean orb, being different from the two dim eyes of the present, will perceive the world quite differently as a matter of course, and, aside from that, the world itself will necessarily have been altered.

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Archeology and the Present

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WHEN, to the thinking mind, the past becomes visible in the present, what a new and infinitely more fascinating present we possess! With awe we read of the wonders of modern scientific discovery. Sometimes we hear it said that modern discoveries are coming to annihilate space and time. In a certain limited sense, perhaps yes—but, far from annihilating space and time, we are setting before ourselves the picture of *more* space than we knew before, and as for *time* we are learning to look so far back into time, we are finding behind us such long corridors of hitherto-unknown time, that our minds refuse to take it in.

In 1833 scholars were looking back, at the most, upon three thousand years of history. But let a present-day historian of antiquity pause in his backward flight at the year 1000 B. C. With his face still turned toward the past he finds that he can go back another three thousand years before the beginnings of Greece and Rome, traversing great centers of civilization filled with eager, modern-minded people making great strides in mechanical achievement and surrounding themselves with that which contributes to a life full of satisfaction for the senses. And still he is not yet at the beginning. Though the discovery of metal was made in Egypt as early as 4000 B. C., for a long time thereafter the Egyptians continued to build the tombs of their kings out of sun-baked brick. Then some skilful workman found that he could cut square blocks of limestone with his copper tools and line the tomb chamber with these blocks in place of soft bricks. So far as we know, his was the first piece of real stone masonry ever put together; yet less than a century and a half later the Great Pyramid was built. Most of this advance was made between 3000 and 2900 B. C., during the thirtieth century B. C. Such rapid progress in the control of mechanical power, found, says Breasted, in no other period of the world's history until the nineteenth century A. D., was accompanied by a remarkable organization of government including a complete and effective system of taxation, by a code of

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written law in the hands of each magistrate, and by wonderful progress in art. Among the achievements of Egypt before 2500 B. C. are the earliest examples of plumbing known to us, jewelry hardly surpassed by the work of the best goldsmiths and jewelers of today, linen so fine that the rarest work of the modern machine loom is coarse in comparison, and portrait sculptures as lifelike as those produced by any age. That this great mechanical age was not without immaterial possessions also, is indicated by two beautiful lines from an Egyptian tomb inscription that dates from 2600 B. C.

Thou hast departed in order that thou mightest live,
Though thou sleepest, thou wakest again; though thou diest, thou livest again.

The next five hundred years show devices for astronomical calculations; songs of praise for religious services; the earliest known really scientific document, containing the earliest known observations on the human brain; other medical treatises; books on arithmetic, including our decimal system; the earliest census sheets; and (note especially the appreciation of moral values) the proud boast of a ruler who cut on the face of the cliff,

There was no citizen's daughter whom I misused; there was no widow whom I oppressed; there was no shepherd whom I expelled; there was none wretched in my community; there was none hungry in my time; I gave to the widow as to her who had a husband; I did not exalt the great above the humble. . . .

To Egypt of the fifteenth century B. C. belong Thebes, the first great monumental city, i. e., the first city built on a plan of development as a symmetrical and harmonious unit; the temple of Karnak, which contains the greatest colonnaded hall ever erected by human hands; and the first great woman in history, an administrator of the highest order, who took part in the building of the temple of Karnak. The Egyptian expedition of the Metropolitan Museum of Art of New York City has just completed twenty-five years' work and the museum has opened an Egyptian room, which contains nine statues of Queen Hatshepsut, the woman just mentioned. The story of the unearthing and piecing together of these statues, demolished by Thotmes III in revenge for his ten-year subjection to his stepmother, is one of the most exciting records of recent archeological

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discovery. In this period, too, immaterialism accompanied mechanical achievements. Inscribed on the walls of tomb chapels are the hymns of praise composed by a youthful visionary and idealist who was a king in Egypt in the fourteenth century B. C. and whose faith embraced a belief in one God, the creator of all creatures and of all races of men, both Egyptians and foreigners—a kindly father who maintained all his creatures with such goodness that even the birds in the marshes were aware of his kindness and uplifted their wings like arms to praise him. When can we find a more extraordinary emancipation of the human spirit from traditional limitations?

We know through quite recent archeological finds that the Asiatic civilization of Mesopotamia is as old or older than the Egyptian, and that the Sumerians were still earlier dwellers in the land of the two rivers later dominated by Chaldeans, Assyrians, and Babylonians. In the course of ten different archeological expeditions (English, French, German, and American) now at work in the Tigris basin the existence of six stages of civilization preliminary to the great age of Ur, which was about 3000 B. C., has been established; and in the vicinity of Ur, the early home of Abraham, Professor Woolley of the University of Pennsylvania has discovered a deposit in the soil which is evidently the result of an early and very extensive flood. "It may still be a little early to go as far as the excavators have gone in stating their belief that they have found the actual basis of the Deluge; but they may be right." Many conclusions, however, drawn from the work of the last few seasons at Ur, are beyond question. Its inhabitants were accomplished mathematicians with formulæ for the extraction of square and cube root. "Not only were there wheelwrights in Ur about 3500 B. C. when the royal graves [recently uncovered] were dug but—the architects knew how to build arches and domes." And here, as in Egypt, belief in immortality was strong. "Into the burial pit, following their dead sovereign, marched the court in full regalia—courtiers armed and in uniform, ladies-in-waiting clad in their best, guards, men-servants and maids, and there laid themselves down in death to accompany their dead eladers."

Why do we build our churches with steeples? In what literature is the earliest tale of flying by man? Where did the earliest building of permanent roads take place? The earliest writing of musical notation? Where was the oldest schoolhouse carefully equipped for the

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teaching of children? Where was built the earliest bridge? The answers to some of these questions come from Ur, and others from the great commercial civilization which flourished in western Asia, when the glory of Ur had departed. Within the last year Professor Henry Frankfort, the leader of an expedition sent by the University of Chicago, asserts as fully established the existence of a "complete banking system" there as early as 2800 B. C. As in Egypt, the position of woman in this early Babylonian world was a high one. Women engaged in business on their own account, and some even became professional scribes, the learned profession. Marriage was already a relation requiring legal agreements, carefully regulated in Hammurapi's code, between the man and his wife. The credit of being the originators of the first alphabet in the world, long assigned to the Phœnicians, is now a matter of dispute between the Minoans of Crete and the Semitic originators of a cuneiform alphabet of twenty-six or twenty-seven letters in use in western Asia as early as 1400 B. C.

One of the most astonishing finds of all has been the unexpected discovery, within a generation, of two forgotten civilizations, the Minoan in Crete and the Hittite in Asia Minor (the present Anatolia), which in age, power, and glory belong beside Mesopotamia and Egypt. Archeologists are also being led by recent discoveries to believe that India may have been the seat of another, equally old.

But predating all I have mentioned lie the great fields of prehistory, the unimaginably long periods of geologic time which archeology has revealed and is developing, and peopling with our ancestors, who discovered fire, invented language, knew family life, art, and religion. Even conservative archeologists agree that in Europe man's existence covers a span of three hundred thousand or four hundred thousand years. One of the most astonishing archeological discoveries of recent date was the uncovering in December 1929 of the bones of Peking man in China, Sinanthropos, who lived 250,000 years ago. Recent searching in the caves of Palestine has carried the story of man in that land back to at least 30,000 B. C. Sir Arthur Keith, one of the most distinguished of English scholars today, reckons the antiquity of agriculture in the East at from ten thousand to twelve thousand years. Prehistorians are seeking to work up from man's origin to the beginnings of what may be called civilization, while historians of antiquity are seeking to reach back from the period

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of written records to the same goal. Archeology is continually opening doors into older periods of civilization. Sir Arthur Keith says:

> When we seek to carry the beginnings of human civilization in the East back to so early a date as 10,000 or 12,000 B. C.—a time when Europeans were still in the later stages of the Palæolithic culture—we do not make too big a draft on the bank of time.

The consciousness of this great gap is present in the minds of the scientists today. And archeology, the bridge, no longer a series of happy accidents, an avocation, or an amusement, but a science, embraces the archeology of the spade with its improved methods of excavating, including the use even of airplanes; and the archeology of the scholar's study where the problems of understanding and applying results are worked out with rigorous exactitude, where the worker is at once archeologist and historian.

The growth of archeological research marks the modern trend toward internationalism. A recent number of the *American Journal of Archæology* included reports of field work in Egypt, Iraq, Syria, Palestine, Anatolia, Persia, Arabia, Cyprus, Greece, Italy, France, Hungary, Bulgaria, Jugoslavia, Great Britain, North Africa, India, South America, and the United States. Representatives of different nations work side by side. The discovery of Sinanthropos resulted from the cooperation of a Canadian anatomist, a Swedish geologist, a French archeologist, and a Chinese director of excavations. In Athens, Rome, Jerusalem, Carthage, and elsewhere, the British, French, German, and American schools are coordinating their efforts. Soviet Russia has also joined the swim.

It cannot be said that ancient civilization has ever died, for it still lives in all the chief manifestations of modern culture. "The creation of a uniform world-wide civilization with similar social and economic conditions is now going on over the whole expanse of the civilized world. But this condition is not new, for the ancient world also lived for a series of centuries a life which was uniform in culture and politics, in social and economic conditions." As Mr. Rostovtzeff has admirably pointed out:

> The modern development in this sense differs from the ancient only in quantity and not in quality. The ancient world witnessed the creation of a

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world-wide trade and the growth of industry on a large scale; it lived through a period of scientific agriculture, and through the development of strife between the different classes, between labor and capital. It also witnessed a period when each discovery became at once the property of all civilized humanity—when the nations and peoples, over the enormous expanse embraced by the Roman Empire, came into daily and constant contact, and when men began to realize that there is something higher than local and national interests, namely the interests of all mankind.

The ancient world created the three main forms of government which are still preserved, the monarchical; the self-ruling free state, where all power resides in the sovereign people and its chosen representatives; and lastly the federal system which combines in one political alliance a number of free and self-governing political units. To this day we have never got beyond these three fundamental forms of government.

Our dependence on antiquity is just as great in the sphere of science and art. Modern exact science has been built up entirely on the method of experiment and this was first applied to the natural sciences by the Greek thinkers of the fourth and third centuries B. C. Our philosophy and morals are still founded on the scientific methods of abstract thought first hammered out by the ancient philosophers, especially Plato and Aristotle. In literature and the plastic arts we merely build on foundations laid by the genius of the ancient writers and artists; we re-fashion the same literary ideas and the same artistic themes which they originally created.

But not to dwell further upon these fundamental and universally recognized ways in which modern life is determined by antiquity, archeology, by keeping the past continually before us, determines for us to a very great extent the line of our endeavors, the direction of our interests, and even our amusements. In the present period of doubt, when all things are being re-evaluated, the only touchstone in each case must come from the past history of the race. More and more all values created by the sixteenth century or later, which make up the great experiment of individualism, are being challenged, and artistic creators more and more are looking further back, some to Greece and Rome, some to Babylonia and Assyria, some to the Byzantine Empire or early medievalism, and some to the ancient cultures of our own country, i. e., to the various domains of archeology.

Illustrations come from every field of art. In the dramatic field we have only to recall that when Eugene O'Neill's *Mourning Becomes Electra* was first being given in New York, Henry Gide's *Œdipus*, Lenormant's *Medea* and Giraudoux' *Judith* and *Amphitryon Thirty-*

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Eight were on the boards in Paris and Brussels. A year before, a play of Aristophanes had a run of over forty nights in Philadelphia and over two hundred in New York. *The Chicago Tribune* for November 30, 1930, when the same play was in its tenth week in that city, contained the following comment: "It is in all probability the longest run that any Greek play has ever had. It is the longest revival that any classic has had in New York for generations. It is a longer run than any play of Shakespeare's has had in New York—just doubling the run of John Barrymore's *Hamlet* when he was at the height of his fame." Mary Wigman uses an art medium which goes back directly either to early medieval times or to pre-classic models. Of what are our composers thinking? We have the *Elektra* of Strauss, the *Œdipus* of Stravinsky, thirty-one operas based on the story of Medea, and twenty-seven on the story of Orpheus and Eurydice (to select only a few of the many cases in point). In contemporary literature other than dramatic one thinks of the *Ulysses* of James Joyce, the modern Ulysses who runs the famous round of chances and adventures in the compass of a single day, of Thornton Wilder's *Woman of Andros*, of Paul Claudel's entire dramatic theory, and of John Masefield's *Tale of Troy*. Upton Sinclair, perhaps the most widely known social reformer in the world today, recently pointed a moral for American society in a story of Roman society. What of modern painting and sculpture? Are those arts not freeing themselves from ancient influence? I have by no means attempted an exhaustive survey in any line, but by chance I have recently had brought to my attention the names of M. Franz Huygelen, a leading Belgian sculptor of today, two American painters, George H. Snowden and Joseph Lindon Smith, besides the whole school of Moukhtar, the modern Egyptian sculptor, all of whom, though they show originality and express wonderfully the spirit of their own times, have chosen the ancient classic symbols as their best medium. What are our twentieth century architects seeking to do? Some are experimenting with new things, but in their skyscrapers many of them, by means of modern materials, are giving to New York a skyline similar to that created by the towers of medieval Bologna or San Gimignano. Some in California are reviving the ancient Mayan work of Honduras and Guatemala, many elsewhere are still vainly striving to produce a Greek form as perfect as the Parthenon, while the millions of many a uni-

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versity are going into copies of the ancient stadiums. Forty years ago Baron Pierre de Coubertin, strongly under the spell of Greece, dreamed a modern Olympic festival and in 1896 the games were celebrated at Athens after many centuries of oblivion. France and Germany are replacing the old walls and fortifications about their cities with playing fields and stadiums, and Italy has a grandiose plan for a stadium in Rome to seat 130,000 people. Pertinent in this connection, because of its bearing on athletics, is the description in a recent issue of the *American Journal of Archeology* of a magnificent swimming pool just discovered in a 1500-year-old palace at Kish, the great city in the middle of the desert of Iraq and believed to be the oldest city in the world, which had a circulatory system of fresh water like that in our best modern swimming pools.

Even in science we seem still to be following our ancient leaders. I am not speaking of the recent revival of the worship of Apollo the sungod as the source of healing, but of "Chemistry in Ancient Persia," a magazine article of August 1930, and *Psychology, Ancient and Modern*, a book by George Sidney Brett, published in New York in 1928, which dwell on the reemergence in these two sciences of ancient interest. One of the most spectacular feats of modern archeology was the recovery, by the draining of Lake Nemi in 1929 and 1930, of Caligula's two galleys, important largely for their revelation of an advanced knowledge of physics and mechanics evinced by surfaces revolving on a type of ball-bearings, by a water-pump, stop-cock, and water wheel of great mechanical perfection, and by an anchor of the type of the "Admiralty Anchor" adopted by the British marine in 1852. These two ships, built by a Roman emperor of the early first century A. D., are longer than any built in the sixteenth or seventeenth centuries. Even the belief that our modern age is original in its many devices for human comfort is shaken by the discovery of an ancient palace in Cyprus with bedrooms on the second floor heated solely by steam. The account adds, "If modern plumbing possessed the simplicity, and the durability of materials that characterized this plant of 2400 years ago, there would be less hammering of the radiators and telephoning the janitors on wintry mornings."

In all seriousness, such knowledge teaches us humility. There was never a year in all this stupendous procession of years that could not

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congratulate itself on being the very essence of modernity. Is a belief that our time must be the flower of all times less naïve than the assurance many a man has had that his land, and his land only, was God's own country? The Old Testament claim, "We are the people, surely wisdom shall die with us," is an indication of no more foolish conceit than the belief that surely we are the people and such is our wisdom that it shall remain the permanent possession of the race. If we in our age are the "roof and crown of things," to adopt Tennyson's phrase, we can well afford to be humble; if not, no other attitude is so becoming. How many times already has our Western civilization gone back to the values of the past to find new strength! In the early fifth century St. Augustine incorporated into Christian doctrine what was of essential value in Plato; in the thirteenth century Thomas Aquinas in the same way turned to Aristotle. The Renaissance renewed a dying world by reviving Greece and Rome—at a time when Greece and Rome were relatively little known, and yet could already enthrall the imagination. Nearer to us, Goethe found in Greece his greatest masters—and yet he knew only the Greece of Winckelmann, a "partial Greece," far from the splendor archeology has shown us.

But the essential gift of archeology is its revelation of real values. Let me quote from that one literature of the world which alone spans thirty centuries and read what a great Greek poet of today has said. He had in mind that surpassing period of Cretan history, the sixteenth century B. C., a period whose art-remains, Mr. Breasted says, "belong among the finest works of decorative art ever produced by any people."

> And then as now, on the most ancient fields of Cnossos
> —So many thousand years ago—
> Women and men, roses and nightingales, made love
> Among the flowers of May and April.
> And then as now, the laws and arts were blossoming
> As wisdom blossomed in the mind;
> And Minos shone upon his throne.
> And then as now, the sculptor carved on the marble stone
> A lily. All that was is gone;
> Only the lily lives.

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How Australia Met the Crisis

HARRY THOMSON K. C.

IF one were trying merely to be epigrammatic one could say, with more reason than lies at the back of most epigrams, that there are no two countries more alike and no two countries more dissimilar than are the United States and Australia. For the reason, however, that one must try rather to be truthful than epigrammatic, and for the reason too that we are at last beginning to learn that political economy is very much a creature of time and place and policy (as List taught a great many years ago and Machiavelli a great many years before him) it is necessary to go beyond the epigram and set forth the similarities and dissimilarities.

The picture must be drawn with a large brush, for the canvas is large and there is no time for pre-Raphaelite detail. But the picture must be drawn, for the steps taken by Australia two years ago to re-establish herself and in fact to prevent disaster were, after all, merely machinery, and machinery must be appropriate to problems. Dredging machinery may be required in one locality, pumping in another, and fire extinction in a third. An economic blizzard (which is the American phrase) may require one treatment, and an economic drought (which is Australian) something quite different. And whatever confusion there may be in the metaphors there must be none in the appropriate machinery. I must therefore state the conditions existent when the economic blizzard (or drought) arrived rather more than two years ago.

Geographically, Australia is a vast country, almost the size of the United States, but with a population not of 130,000,000 but of less than 7,000,000. Settlement is rather like a new moon in shape, running with a huge sweep from North Queensland round the coast to Perth in Western Australia, a sweep of nearly 5,000 miles with the thickening of the crescent in the southeast corner. Half the people are in five large cities (which is itself an extraordinary phenomenon).

By the use of high tariffs Australia has built up a good deal of manufacturing, but owing to her high standard of living and the fact that the smallness of her home market is unable to support mass, and there-

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fore cheap, production, she has exported and can export practically no manufactures. Certain classes of manufactures she almost entirely imports, *e.g.* cotton goods, motor car chassis and parts, picture films, and a good deal of specialized machinery. Her exports have always been of primary products—wool, wheat, silver, lead, zinc, wine, dried fruits, gold, and latterly, dairy produce. Of these it will be noticed, and it is an important matter to notice, that wool is the only one in which she can exercise any material effect on world prices. As regards the other items she must just sit down and take what comes to her from time to time in the name of world prices. She can depress that price by injudicious selling or dumping but can really do nothing effective in increasing the price.

Those were the industrial conditions. There remain the financial and the political. The financial can be stated very shortly. Australia was very definitely a debtor nation. Of her total national debt of about 1,100,000,000 pounds sterling about half was owed externally, that half being owed almost entirely to Great Britain, or more accurately to private investors in Great Britain. In respect of that half, a little over 30,000,000 pounds sterling had to be sent overseas each year in interest. In addition, of course, whatever was imported had to be paid for. And as regards the Australian owned half of the national debt, another 30 to 35 million pounds of interest had to come out of Government revenue.

The national income (*not* Government revenue) before the depression was about 650,000,000 pounds sterling a year. It dropped by about one-third, but of course fixed interest charges did not drop, and what made the matter more difficult was that as the London money market, which had so long been a much too convenient milch cow, dried up, English money rapidly came to a premium and English interest and other charges had to be paid in a correspondingly depreciated Australian currency. The extent of this depreciation was at one stage as high as 30 per cent, but of this more anon.

This, then, was the financial picture: National income dropped from 650 to 450 million pounds; interest to London took 40,000,000 Australian pounds instead of 30,000,000 pounds; Australian Government interest took another 35,000,000 pounds; while imports (some of which were essential, and the total of which had reached 130,000,000 pounds a year or two before) had to be paid for

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at a higher (Australian) rate. And all these external payments had to be met either by gold (of which there was not very much) or by the export of primary products of which the world selling prices showed a loss on production.

The political picture must be looked at. Australia is a curious attempt to combine English and American models. From the United States she has taken the distribution of legislative powers between Commonwealth and States. From England she took the whole doctrine of Cabinet (or Executive) responsibility to Parliament. An adverse vote in Parliament on a major issue means a change of Government. It is of note that, government being very largely a matter of *finance, that widow's cruse of all taxation—customs and excise—is* exclusively a province of the Commonwealth. Other spheres of taxation belong both to State and Commonwealth. The borrowing mania of the States had, however, became so great, and the folly of rival States and Commonwealth bidding against each other for loans on the London market had become so obvious, that two or three years before the depression an agreement had been made by States and Commonwealth that no more loans should be issued without the sanction of a Premiers' Conference. By way of parenthesis it should be mentioned that "Premier" in Australia is the term used for the head of a State Government, "Prime Minister" being reserved for the Commonwealth Chief Minister.

By 1930 the members of this Premiers' Conference had formed the habit of meeting with each other annually, or more often with the Commonwealth representative, to sub-edit each other's demands for loan moneys, and in effect to budget *en masse* for the borrowing and apportionment of such moneys. Furthermore, two or three years before the depression all State debts had been consolidated and made a responsibility also of the Commonwealth in return for certain financial and political considerations given up by the States. The only other factor important to mention is that Australia is subject to a nation-wide scheme of wage fixation affecting practically all unskilled labor and nearly all crafts. Its peculiar feature is that it follows the cost of living upwards and downwards, in most cases automatically and by quarterly adjustments.

These, then, were the conditions assembled to meet the depression. It was inevitable, and in the result fortunate, that it should hit Aus-

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tralia very early. Her abounding prosperity in the decade following the war was due to two things—the high price of her primary products which constituted the whole of her external income, and the fact that she was borrowing too easily and living on the borrowed money. World prices dropped and her external income nearly vanished. The fount of borrowed money dried up and she could no longer live on other people's capital.

The symptoms in Australia were quickly made manifest. Unemployment figures raced up, in some States to over 30 per cent. State and Commonwealth treasurers found themselves faced with ever-growing deficits, the railways (which are all owned by Commonwealth or State) showed heavier and heavier losses, bankruptcies and liquidations grew, the banks became more and more reluctant to increase Government overdrafts, one State repudiated an interest payment on Government bonds, and others wondered how they were to pay their civil servants.

Because the Premiers' Conference afforded very apposite machinery for the discussion of these difficulties a Premiers' Conference was called and proceeded to deliberate over a momentous fortnight. It evolved what came to be known as the Premiers' Plan, and undoubtedly saved Australia from repudiation, bankruptcy, and possibly—for these things follow in train—revolution.

The Plan was not evolved without a struggle, which was mainly political. Although there are many names and cross-currents in Australian politics there are only two forces, which can be conveniently called Labor and Anti-Labor. Labor said, "There is plenty of wheat and wool here, cattle, sheep and dried fruit. This is only a money or a currency problem. The obvious thing is to circulate more money and credit. Let us go ask the banks." So they went and asked the banks. Fortunately the banks in Australia are very strong. They consist of six or eight private trading banks, owned by shareholders, with scores of branches in each State, and with a conservative banking tradition in each instance running back forty years and upwards. And there is a so-called Commonwealth Bank which is part savings bank (with Government guarantee) and part (but not completely) a trading bank with certain of the powers of a central reserve bank. No bank now issues its own notes, but the currency is Commonwealth owned and issued, and is obtained by the trading banks through the Common-

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wealth Bank. The Commonwealth Bank was bound to keep a gold reserve proportionate to the issue of notes.

In reply to the Premiers' requests the trading banks said, "We are sorry. We cannot increase your overdrafts. Our advances now are 100 per cent of our deposits and over. We have dipped into our reserves, and even into our private capital to extend credit to you and our customers to the utmost. More would be highly dangerous to our very stability." In spite of a great deal of political and personal pressure the Commonwealth Bank was equally adamant. It pointed out that on Government overdrafts and short term loans it had already advanced a great many millions, and to the suggestion that so many million pounds of new notes be issued and used to extend credit "to keep the wheels of industry moving" it entered an emphatic negative.

The contest then became frankly one between the inflationists, who desired to keep wages and expenditure up, and the "economists" whose goal was a reduced cost of production and lower Government expenditure. Although the state of the Government purse was only a reflex of that of the private purse it was inevitable that this Conference of Premiers, being political, should think hardest about the Government deficits. How could the gap be bridged between revenue and expenditure? Labor said, "Keep up revenue (and wages), even if you have to make extra currency to do it," and they talked about high purchasing power and so on. Anti-Labor answered, "To inflation there is only one end—bankruptcy. See what happened to Germany and elsewhere! We must concentrate on reducing expenditure." Finally anti-labor won and the Premiers' Plan, being an agreement between all the Governments concerned, was evolved.

The essential feature of the Premiers' Plan was a reduction in Government expenditure, but it did not stop and was not meant to stop at Governments. An arbitrary, or rather a compromise, figure of 22½ per cent was agreed on. All Governments agreed to reduce their "variable" expenditure by this amount. An immense conversion scheme covering the whole of the Australian internal loans of about 600,000,000 pounds was put through in a few weeks, the effect being a reduction of interest rates by 22½ per cent and a spreading of the term of the loans over a period lasting from 1938 to 1960. Since it was obviously impossible to balance budgets within one year or two without completely dislocating the civil service, a period of three or

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four years was fixed on, within which by progressive steps budgets should be balanced. On these conditions the Commonwealth Bank agreed to provide certain credits to meet current interest payments, and to tide over for the time certain Government working expenses.

But the same principle was applied to the community at large, it being realized that the body politic was just as sick as its head. In a masterly pamphlet published a few years ago Stragosch showed that in times of depression the profits of the entrepreneur disappear first, wages are very considerably squeezed (particularly when one spreads the effect of unemployment), while fixed money charges (interest, rent, and so on), suffer very little by comparison.

In Australia profits had very nearly vanished—it was quite unnecessary to do any "reducing" there. For reasons mentioned earlier, wages were following closely the general decline in the cost of living. The Federal Arbitration Court, however, felt that it was not enough to drop the absolute cost of wages but that there ought to be a relative drop as well, *i.e.*, that the standard should come down a little. It accordingly dropped the basic wage by 10 per cent. State Industrial Courts did much the same, with the net result that wages generally in Australia dropped in money value by from 25 to 28 per cent, this without taking into account the great mass of unemployed and applying only to the individual wage-earner.

There remained fixed money charges, which were all matters subject to the jurisdiction of the States as distinct from the Commonwealth Government. And while there have been variations in detail, speaking generally the following legislation was enacted in all the States:

1. *Mortgages*—The rate of interest was reduced by 22½ per cent (but not below a minimum of 5 per cent) and a moratorium was given with regard to capital.
2. *Leases and Tenancies*—A reduction for three years in the rental value of recent leases was given. The extent of the reduction was 22½ per cent.
3. *Banks*—The banks agreed (without legislation) to reduce interest rates on overdrafts, and have done so.
4. *Pensions*—Old age and invalid pensions were cut by 12½ per cent, and other savings effected in their administration.

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5. *Farmers*—In several of the States special legislation was passed preventing farmers from being sold up, providing for Government relief, and providing also for Government administration by way of rationing crop proceeds in a stated order of priorities.

The motives underlying these enactments were, of course, complex, but the principle of equality of sacrifice was outstanding. The entrepreneur had borne more than his share, the workman was bearing his; it was but fair that the rentier should bear his. Incidentally industry wanted all the help it could get from a lowering of the price it had to pay for its capital.

Two other important steps were taken. Owing to overseas interest commitments and the low prices of primary products, the balance of trade yawned so widely against Australia that imports had to be cut in half. By a series of very high duties, and in some cases, embargoes, this result was achieved. And then there was the question of exchange. Exchange on London was 30 per cent or later 25 per cent. It was seen that this was a covert but very effective way of helping exporters, which meant in other words, helping the man on the land. He was paid in sterling, which meant Australian money plus 25 per cent. Or putting the matter another way, he did not calculate his price in the relatively depreciated Australian currency, as did all others buying and selling in Australia. It was a clear preference to him over the rest of the community, and a preference at the time when he sorely needed it.

Long after the restriction of the flow of imports had made English money more accessible and therefore cheaper, and even when England went off the gold standard nearly two years ago, the exchange rate was maintained at this 25 per cent, and still is. What was not realized at first, and is not even yet universally recognized, is the obverse side of the picture. To prefer one class of the community would seem to defer another class, such as those engaged in secondary industries and particularly labor whose whole remuneration is calculated on the cost of actual living calculated in terms of Australian currency. So obvious is this that I have heard the high exchange policy described by New York businessmen as a very subtle attack on labor and therefore on cost of production. And logically, of course, that is

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true. And yet so little does economics at times care for logic that in actual fact in Australia prices of most things that enter into the ordinary household régime have not risen in terms of Australian money but dropped or remained stationary. This question of values and prices seems to be very much a domestic one and to be much more complex than Adam Smith even dreamed of. For the purposes of this article the important point is to record that primary industry was very much helped by a high exchange rate and no one seems to have been hurt very much.

There remains but to sum up. I have tried in the previous very brief sketch to avoid names, statistics, and (what is a temptation for a lawyer) detailed consideration of the various Acts of Parliament for these could have no possible interest to Americans. America seems to be faced with some of the same, but also different, problems. The outstanding feature of the contest in Australia was the pitched battle on the inflationist issue. Definitely Australia decided against that, and the reason was put as well by the Commonwealth Arbitration Court as by any other authority. That Court, faced with the argument that high wages would increase and a reduction of wages would diminish purchasing power, said in a considered judgment that these things had nothing to do with the amount of purchasing power but only decided who was to have it, and that only increased production could increase purchasing power. The Commonwealth Bank argued in much the same way about currency inflation.

The effect of all this was not so much to make a new social or industrial plan as to create the machinery to hold the position until world prices improved—a reinforcement of existing bulwarks against the existing strains rather than an attempt to create a new heaven and a new earth.

To vary the metaphor, it was rather like a hungry man tightening his belt in the hope and belief that sooner or later conditions generally (that is, world conditions on which Australia so greatly depends) would improve. In banking and many other businesses in Australia there is quite a strong Scotch infusion and what is just as effective, a strong Scotch tradition, and consequently it was not surprising that when the strain came there should be a distrust of plans, whether inflationary or otherwise; or that the effort should be made rather to cut the Australian coat according to the cloth available, and to try

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to live within one's income by cutting expenditure, than to attempt ill-tried methods of currency manufacture, which a small, somewhat dependent, country could scarcely hope to control.

However that may be, the scheme adopted has on the whole done most of what it set out to do. Government deficits have dropped in two years from nearly 30,000,000 pounds to 8,000,000 pounds and the Commonwealth Government this year has a surplus. Government stock, though reduced by the conversion loan to 4 per cent, is all over par. A great many companies are now beginning to declare small dividends. Unemployment, though much too high, has dropped from 30 per cent to 25 per cent (the figures are based on the returns of trade unions and refer to the percentage of their own members out of employment but may be taken as typical of the community as a whole). Bank advances now bear a safer relation to deposits and deposits themselves have increased considerably.

On the obverse side of the picture lies the fact that the floating debt of the various Governments in Australia has increased to about 100,000,000 pounds sterling, which is of course a mild form of inflation —of credit rather than currency. There is also apparent a suggestion of weariness of too much well-doing. The Australian is a mercurial fellow, inclined to regard every puff of wind as a gale of prosperity, and to ask for his wages to be restored to their recent level. The Commonwealth Civil Service has just done so. And the position of a good many of the wheat farmers and pastoralists, though improving, is still extraordinarily difficult, and only the greatest leniency and protection by Governments, banks, and creditors is enabling many of them to carry on. But on the whole the corner has been well turned. Two and a half years ago one was fearful, wondering what possible investment would be safe against cataclysm, and whether it were not as well to buy a little dairy farm where one could at least have a cottage and grow one's daily food. Now Government bonds, most of the big pastoral companies, various public utility companies, and a sprinkling of industrials are all good sound investments, or thought to be so. And that seems to be a very good test of whether the Australian plan has been a success or not.

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The Great American Adventure

ROYAL MEEKER
President of the Index Number Institute

THE United States, the home of individualism and private economic enterprise, has undertaken an experiment in social control of production and distribution on a scale second only to the Russian experiment. The Agricultural Adjustment Act, the National Industrial Recovery Act, the Banking Act of 1933, the Emergency Railway Transportation Act, the Joint Resolution on Currency, and other emergency measures, passed at President Roosevelt's behest by the emergency session of the 73d Congress, constitute the most remarkable body of legislation ever enacted by a United States Congress. Until these Acts were actually passed few persons could have believed it possible that such radical departures would be made from the traditional American policies of leaving money, banking, and business to run themselves and the country. Almost overnight this country changed from the most aggressive economic individualism to an equally aggressive policy of social control of production which may possibly develop into either economic socialism or economic fascism. The depression has brought this astounding transformation in the attitude of Americans toward business and government. In this time of adversity the people have demanded Federal relief and Federal control of business enterprise. The drastic measures of control which have been embodied in the farm crop control and the industrial codes have been upheld by the courts as temporary measures necessary to overcome the economic emergency. If these radical control measures are successful they will probably be continued in considerable part after the emergency has passed. With the restoration of prosperity doubtless much of the traditional "rugged Americanism" will be restored, but the old economic order can never be restored in all its pristine crudity with its exaltation of "freedom and inviolability of contract," "law of supply and demand" as the determiner of all prices and things economic, "let the buyer beware," the sacred "gold standard of value," and other "indefeasible natural rights."

The main objectives sought by the several recovery acts are: the

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restoration of the buying power of Americans, which would help to revive business everywhere; the increase of employment, consumption, and production; the shortening of the hours of labor; the establishment of minimum wage rates; a raising of the general price level by an expansion of the volume and the velocity of currency in use; the helping of business and especially agriculture by lightening the load of debts through a reduction in the value of the overgrown dollar and through scaling down interest and principal; the unification of our banking system to make it more helpful and less hindering to business; a provision for the planning of production to supply consumption needs; the prevention, so far as possible, of overproduction and underconsumption; the elimination of cutthroat competition in all lines; the adoption of measures to prevent foreign producers from capturing American markets with lower priced goods made by underpaid labor; the promotion of international trade on an equitable basis by eliminating or modifying hurtful trade barriers.

The objectives enumerated are not intended to be mutually exclusive. Most of them overlap, some are synonymous, some are contradictory. For example, buying power can be restored only by increasing production, employment, wages (earnings) and consumption. Again, the promotion of foreign trade conflicts more or less sharply with the protection of the American home market by tariffs, inflation, or other means. A glance through the list of objectives is sufficient to overwhelm one with the stupendous job which Congress has rather casually handed over to the President, but Mr. Roosevelt has gone to work eagerly and hopefully to carry out these tasks which make the classic labors of Hercules seem like child's play. All who believe in the possibility of an improved economic order must admire the courage, boldness, and idealism of the President even though they may disapprove the whole program of the Administration.

The theory upon which the President's industrial recovery program is based is simple. Employers are to employ more men at higher wage rates for fewer hours per week under the assumption that this policy will give employment to more workers and increase their buying power, thus increasing the demand for consumers' goods and stimulating production and employment.

The theory as stated is too simple to be safe. The buying power of the people cannot be increased by merely establishing a shorter work-

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ing week and higher minimum wage rates to be shared by a larger number of workers. The real buying power can be increased only by increasing economic production. The coordination of all industries under a national economic plan may effect such economies that production and consumption will be increased, but minimum wage rates and shorter working time will not necessarily increase the amount of money paid into the hands of the workers—in fact, the total wage payments may be decreased. Even if the total money wage payments are increased for a time by reason of a revival of confidence and of business, there may be an actual decrease in the real buying power of the workers. This unfortunate result would follow if retail prices of commodities and services should rise faster than the total money wage payments. Statistics of the cost of living and of factory payrolls, compiled by the United States Department of Labor and the National Industrial Conference Board, indicate that from March to July inclusive, payrolls increased somewhat faster than retail prices. Unfortunately statistics of retail prices and wage payments are slow in appearing and are not too accurate when they do emerge from the statistical laboratories. It seems probable from the check to production and trade during August that consumers' prices have overtaken and passed payrolls. Consequently, in spite of the signing of hundreds of NRA codes and the reemployment of hundreds of thousands of workers, the real buying power of workers is now declining noticeably. In his memorandum to General Johnson on the occasion of his withdrawal from the NRA Professor W. F. Ogburn stressed the importance of preventing retail prices from rising faster than workers' earnings. This principle is well understood by the officials of the NRA and the need for preventing prices from being boosted too fast and too much has been emphasized by General Johnson and his aides in recent utterances.

Those who believe that the economic system which produced the booms of 1915–20 and 1925–29 and the crises of 1920–22 and 1929 to date cannot be improved upon condemn the whole recovery program as "planned economy." They denounce such reckless tinkering with the immutable "laws of Nature" by irresponsible college professors. They cite statistics of national income, production, profits, and wages to prove that it is impossible by any artificial planning and regulation of production and fixing of minimum wages and maximum

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hours to cause an increase in consumption and production. "Economic planning" defeats itself, they hold. They regard the setback to recovery which has occurred as the inevitable collapse of a plan which was doomed to failure before it began. Statistics of national income show, they contend, that the minimum wage rates can be paid by industries only by drawing upon their accumulated reserves. The conclusion is that when the reserves are depleted either the minimum wages will go by the board at once, or currency inflation similar to the German inflation of 1923-24 will be invoked to enable the employers to pay employees in depreciated dollars.

If the recovery program is mismanaged or fumbled, failure and inflation will follow. But there is no inherent reason why the program should fail. The standpat critics of the program of national economic planning overlook the fact that any economic system must be a "planned system." Up till now the planning has been left almost entirely to individuals who were bent upon securing the largest possible profits. This brand of "planned economy" has produced the existing chaos of business stagnation, unemployment, privation, and starvation. The claim that the highly competitive, profit-seeking economic system creates more efficient machines and methods of production condemns rather than commends this system. Uncontrolled "efficiency" in production is the major evil in the old system which has destroyed and used up irreplaceable natural resources and has created the disastrous booms and destructive "busts" which have characterized the mad economic "development" since the end of the eighteenth century. This system has created the existing state of unbalanced and disorganized production, distribution, and consumption throughout the world. Overproduction in some lines, underproduction in other lines, and underconsumption in all lines is the inevitable result of this kind of "planned economy" in which the multiplicity of overlapping and conflicting "plans" has brought utter chaos.

The statistics cited to show the futility of minimum wage agreements should not be taken too seriously. If a reasonably sound system of planned economy can be made 50 per cent effective, costs and wastes will be reduced and total production will be greatly increased. If the industrial associations function efficiently they will save vast sums which, heretofore, have been wasted in useless or harmful enterprises and experiments, natural resources will be conserved instead

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of destroyed, and the stupendous losses, during depression periods, of capital investment and of excess products in certain lines will be avoided.

President Roosevelt frankly declares that the measures he has adopted are experiments. Imperfections in policies can be discovered and corrected only by the slow process of trial and error. The fundamental principles, however, upon which these policies are based are sound and enduring, and the control and direction of production, distribution, and consumption is necessary for the well being—even the very existence—of all mankind.

The President has been able to secure almost unanimous support for his national recovery program. Of course the ancient conflict between hard boiled employers and employees about "open shop" and "closed shop" has flamed out and threatened to prevent agreements in the iron and steel industry, coal mining, automobile manufacture, and other important industries, and it is certain that no agreements would have been possible in many industries had not the depression brought them to the verge of economic ruin. It was a question of swallowing the bitter pill of collective bargaining or going into bankruptcy. The appeal to patriotism has also had a powerful effect with many employers who oppose the whole theory of the NRA but have signed pledges and come under codes because they feared to be stigmatized as slackers in the great war upon depression. Fear of the untested powers of the Federal government to penalize those who may refuse to cooperate has induced many to sign on the dotted line. General Johnson has very emphatically stated that those who refuse to sign the pledge or a code, or who fail to keep the agreement after signing, will suffer "economic death." The only available instrument of "economic death" would seem to be the boycott, although General Johnson has denied any intention of resorting to "boycotting." The only penalty he has suggested is the removal of the blue eagle from the windows of those who violate the pledge, and so long as public opinion supports the recovery program, the removal or absence of the blue eagle from the establishment of an offender would at once put him on a black list. Patriotic citizens would be in duty bound to refuse to grant him credit, to sell him raw materials and equipment, or to buy his products. No matter what General Johnson might call this, it would be boycotting of the most drastic sort. The only question is: Would the people of

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America support the NRA should any large employer or a considerable number of employers refuse to accept collective bargaining, minimum wage rates, and price control provided in the codes?

For example, Henry Ford, not wanting to be bound to the collective bargaining clause and the maximum hour schedule which other auto manufacturers are ready to enforce, is holding off [September 10] from signing the automobile code and it is said that he is working on a code which will go far beyond the proposed code on minimum wages and other matters. But suppose Mr. Ford should continue to play the lone wolf, and that as a consequence he would get no blue eagle. As a further consequence would bankers refuse to grant Mr. Ford credit? Would other producers refuse to sell him raw materials and would the millions who own or want to own Ford autos turn away from him? What a very serious business the attempt to execute the sentence of "economic death" might be! What would be the verdict of our courts in such a case? It seems incredible that the judicial watch-dogs, which have guarded so faithfully the rights of individuals to acquire, hold, and use property, and to pursue happiness ruthlessly with the minimum of legal restraints would be deaf to the cry of distress which would doubtless be raised by Mr. Ford. Probably the courts would declare the whole recovery program a piece of unconstitutional meddling with the inalienable and indefeasible rights of man, and public opinion would probably back them up. Mr. Ford, instead of suffering "economic death" as a recalcitrant disturber of economic peace and equilibrium, might be exalted as the heroic champion of liberty, "rugged Americanism," high wages, and cheap autos. Let us hope that the NRA program will not be imperiled by any legal conflict with Mr. Ford, the soft coal mine operators, or other employers.

Whether the NRA program will be successful in helping to restore business will not be known for many months. Up to the present writing only about a dozen distinct codes have been approved and about 170 modifications of the "blanket code," to be applied in as many different industries. About 300 codes have been submitted by various national organizations, mostly small associations employing but few workers. The Administration has, naturally, concentrated upon the great basic industries employing the greatest numbers—cotton textiles with about 1,700,000 workers; iron and steel with 880,000;

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lumber and mill products with 875,000; bituminous coal with 700,000; petroleum and its products with 500,000; motor vehicles with 500,000. The heterogeneous retail trades, with more than a million employers and 5,000,000 employees, are much more difficult to organize.

Serious controversies will undoubtedly arise over collective bargaining, minimum wage rates, price control, and other controversial matters under all important codes. Before the ink is dry on the petroleum code, dissension over the terms broke out within the NRA ranks. The conflicts will of course be particularly bitter between labor and employers in the big unorganized industries, steel and automobiles, and the disorganized industry, bituminous coal. In cotton textiles the code has been operating for more than a month, but many more months must pass before any results from its operation can be definitely seen. The quicker start in the textile industry seems to be due to the fact that textiles had begun to recover back in 1932 and were therefore better prepared to arrive at labor and price agreements. The same problems, however, must be met and solved in this industry as in all other industries if the recovery program is to bring recovery instead of more depression.

The decline which industries suffered in August came as a surprise and a great disappointment to many, but its cause is not far to seek. While the NRA was concentrating upon the making of codes nobody was giving attention to the money and credit side of the recovery program, yet it is safe to say that no program of industrial recovery has ever been or can be put over without expanding the circulation of currency. The reason is obvious. Because it is the standard in terms of which the values of all goods and services are measured, the money unit is the most important of all standards of measurement. Unless the money unit is a reasonably exact measure of value, it is a dishonest standard which cheats one group and seemingly favors another group. In depression the money unit is too big, cheating debtors and favoring creditors. In the present depression, as in all severe depressions, the dishonest dollar defrauds creditors as well as debtors. Debtors are required to pay their debts in dollars, which means that to liquidate the principal of their debts they must give more goods and services than they borrowed. Consequently thousands of debtors are forced into bankruptcy and creditors, instead of receiving bigger and better dol-

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lars for their loans, get fewer dollars or no dollars at all. Business is prostrated and everybody suffers.

The obvious thing to do to start business on the up trend is to *reflate* the volume of currency, thereby *deflating* the purchasing power of the dollar. The efforts of the NRA to increase production and wages without increasing the volume of the currency in actual use was a repetition of the traditional stunt of trying to lift oneself by one's bootstraps, and it has failed just as every similar stunt is bound to fail. President Roosevelt is reported to have said that he intends to avoid "inflation" and depend upon "natural means" to restore purchasing power. To increase buying power, production, and employment by increasing the volume of currency in use is certainly more "natural," and much more practical, than to attempt to reach these ends by codes requiring employers to employ more men at higher wages when they cannot sell their products for the costs of production, or by prayers imploring consumers to "buy now" when prices have risen while incomes have remained stationary or declined. Any action designed to reduce the dollar to a reasonable value required by business is denounced by the self-styled "sound-money" men as "artificial" and "unnatural," while at the same time these same men regard the overstimulation of certain business enterprises which receive special favors as "natural" and commendable. Such false notions of "natural" and "unnatural" means of stimulating business should be discarded at once and forever.

It is apparent that the Administration has concentrated too much upon codes, minimum wage rates, increased employment, and higher prices, and too little upon the means whereby the monetary-banking-credit system can be made so to function and lighten the load of debts which is crushing enterprise today as to revive drooping industries. After the currency has been reflated to a reasonable degree the general price level should be kept stable by adding to or subtracting from the volume of currency according to increases or decreases in the volume of production.

A proper control of the money-banking-credit system in accordance with the reasonable requirements of consumers and producers is the simplest, surest, and most "natural" means of reviving business and keeping it going without catastrophic booms and "busts."

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The Turning in the Lane for Mechanism

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RECENTLY I have had alternately in my hand two books, both published around 1921. I had read them some years ago, without particular reference from one to the other, but chance threw them beside each other on my shelves and I took them down together. The interval has served to throw into sharper opposition two eminent scientific thinkers, their authors, and they are the more evidently on the two sides of the "great divide in philosophy."

One is an American, James Harvey Robinson, author of *The Mind in the Making;* the other, a Frenchman, Gustave Geley, and his book, *From the Unconscious to the Conscious.* The former has accepted science and the scientific method as the final road to truth. The Seven Seals of the Revelation are now off and the great ignorances they covered lie open to men's scrutiny and learning; namely, man's physical nature, the working of his thoughts and desires, the world in which he lives, how he has come about as a race, how he develops as an individual, how he is affected by infancy and childhood, and how his ancestors lived for hundreds of thousands of years in savagery. Philosophy may serve a purpose in this pursuit but only as it assumes the instrumental type of Deweyism. Metaphysics may be rated, "like smoking, as a highly gratifying indulgence to those who like it, and, as indulgences go, relatively innocent."

It is this note of conclusiveness, of complete repudiation of all other approaches to human problems and of impatience with any fond backward glances of the newly converted that is so characteristic of a large group of modern thinkers. Poor old metaphysics, guilty as it has been of some extravagant vagaries, can scarcely hope for any chivalric rush to its defense in these days of hardness and fastness. But its "indulgence" represents a broader activity of the mind which many a one is not ready to throw overboard uncere-

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moniously. The protestant will perhaps name it speculation but by it he means much more than revery or meditation. He is thinking of a basic mental process from which the imaginative flight of the lyric, the formulations of the calculus, and the insight of the seer all spring. It is the same human mind, after all, though working under different forms of activities, that has originated both metaphysics and the scientific method. And it is the attempt at a higher synthesis including them both that drives certain high-grade scientific thinkers of today to the use of a type of speculation.

Geley's work represents such an attempt. True to his French philosophic ancestry, he argues that:

> The method of restricted analyses and profound study of details is extremely useful in scientific research, but is without philosophical value. The method of general synthesis is the only one suitable to scientific philosophy for it alone can bring out what is really important in a given order of facts. . . . From the philosophical point of view (the one to which I confine myself) and in a given order of facts, only the comprehension of the higher facts is important, for it includes, *a fortiori*, that of all others. Consequently the descending method only, starting from those higher facts, is the fruitful one.

Poetically (and for this there is always the great Platonic precedent) he conceives of the evolving universe as an ocean of unconsciousness, with small and isolated "islets or icebergs of consciousness" emerging from it and growing ultimately into "great continents whose summits shine in full consciousness." This realization of consciousness is effected by a series of broken lines representing "the perpetual passing and repassing from life to death and from death to life of 'the essential' of the psychological elements individualised in the Self." Most significant, then, is his defense of this mode of thought: "That these propositions are of a philosophic order is undeniable; but they are not metaphysical in the proper sense of that word, because their data are scientific and rational."

Max Planck, whose name will perhaps ultimately outshine that of Einstein, has been for several years vigorously attacking "Positivism," according to which "we have to deal specially and exclusively with that material which is the result of observing natural phenomena through the medium of our senses with of course the help of measuring instruments." Opposing this method, he insists

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that "the physicist is bound, by the very nature of the task in hand, to use his imaginative faculties at the very first step he takes," and that the work of the scientist and the work of the philosopher are complementary one to the other.

A. N. Whitehead, another scientific thinker, whose work sounds a clear and certain note in the confusion of the times, in his first outline of the theory of "organism" summarizes his point of view thus:

> In this retrospect I have kept in mind that the ultimate issue of the whole story is the patent dissolution of the comfortable scheme of scientific materialism which has dominated the three centuries under review. . . . I have endeavoured to outline an alternative cosmological doctrine, which shall be wide enough to include what is fundamental both for science and for its critics. In this alternative scheme, the notion of material, as fundamental, has been replaced by that of organic synthesis.

Also, in his *magnum opus*, *Process and Reality*, he devotes his first chapter to the defense of "speculative philosophy." Alfred Hoernlé has suggested that it may well be that Whitehead is to occupy for twentieth-century philosophy the position often accorded to Kant with respect to nineteenth-century philosophy. It would not be surprising, indeed, to see his work in a deeper perspective assume even larger significance.

We have come to the third great period of synthesis in scientific thinking. The first lacked the benefit of the experimental method, but it laid hold, nevertheless, of many of the qualities of the scientific spirit. Milesian, Eleatic, and Atomist schools of thought studied nature and shaped theories that foreshadowed those more finely forged in later centuries. Then followed the great philosophic syntheses of Plato and Aristotle.

The second period culminated, of course, in the publication of Newton's *Principia* in 1687. Copernicus' *De Revolutionibus Orbium Celestium* had appeared in 1543. Then came Tycho Brahe, Kepler, Galileo, and Leonardo. Newton was a mathematician, not a philosopher; the philosophic syntheses of the age were wrought by the intellectual genius of Descartes and Spinoza.

Lastly, with the discovery of X-rays in 1895 there was ushered in the present brilliant period with its series of great names in ex-

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perimentation, mathematics, and theory, from Röntgen and Rutherford to Millikan, Bohr, Planck, and Einstein. And once more in the train of the explorers have come great syntheses—the work of Eddington, Whitehead, Morgan, and S. Alexander. Also, it should be noted in passing that while the last-named of these is generally classified as a neo-realist, the other three definitely place mind in the background of the universe.

Of course any such summary lays itself open to the charge of oversimplification. Out of the Grecian period and mingling with Neo-Platonic mysticism flowed the influence of the Pythagorean school. On the south shore of the Mediterranean the theories and rudimentary experimentalism of Aristotle survived and advanced among the Arabs for a thousand years. Both streams of influence affected the great figures of the European Revival, including Thomas Aquinas, but the Thomistic synthesis, setting out to establish an authoritarian preconception, in so far lost touch with the genius of the scientific attitude. Again, out of Newtonian physics there developed both evolutionary and reactionary movements—on the one hand the mechanism of Diderot and the other Encyclopedists, together with Hume, Vogt, Büchner, Haeckel, and Spencer; on the other, the opposition to materialism offered by such men as Berkeley, Kant, Hegel, and Bergson. But the last names in both series are associated with a new departure in scientific thinking, that concerned with the evolution of life. Once upon a time the unscientific student might easily have assumed that the introduction of the study of new theories of life should make for the overthrow of tendencies toward the mechanistic, but so powerfully was this tide then running that the new venture in thinking was at first swept along for the most part in the same direction.

What has happened in recent years is common knowledge. Biology has pretty largely had recourse to vitalism. Psychology has discarded vitalism for the *Gestalt* theory, but at least pattern of some sort is basic. Physics has gone farthest of the sciences in dealing with finalities and Jeans, in his *Mysterious Universe*, gives definite expression many times to a concept of idealism. For instance:

> Today there is a wide measure of agreement, which on the physical side of science approaches almost to unanimity, that the stream of knowledge is

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heading toward a non-mechanistic reality; the universe begins to look more like a great thought than like a great machine. The old dualism of mind and matter which was mainly responsible for the supposed hostility (to life), seems likely to disappear, not through matter becoming more shadowy or insubstantial than heretofore, or through mind becoming resolved into a function of the working of matter, but through substantial matter resolving itself into a creation and manifestation of mind.

Eddington phrases the same idea in his sentence: "Recognizing that the physical world is entirely abstract and without 'actuality' apart from its linkage to consciousness, we restore consciousness to the fundamental position instead of representing it as an inessential complication occasionally found in the midst of inorganic nature at a late stage of evolutionary history." Planck's philosophic position is Kantian and anti-Berkeleian, because in Kant the scientist finds metaphysical grounds for what his translator calls his "intransigence on the causation principle." But one cannot doubt either his religious or his idealistic footings when he says:

> . . . it would be a piece of stupid sacrilege on our part if we were to arrogate to ourselves the power of being able, on the basis of our own studies . . . to understand as clearly as the Divine Spirit understands. . . . The profound depths of thought cannot be penetrated by the ordinary intellect.

And even Einstein ventures timidly to formulate an idealistic philosophy:

> The most beautiful thing we can experience is the mysterious. . . . It is enough for me to contemplate the mystery of conscious life perpetuating itself through all eternity, to reflect upon the marvelous structure of the universe, which we can dimly perceive, and to try humbly to comprehend even an infinitesimal part of the intelligence manifested in nature.

Whitehead between his *Concept of Nature* and his *Process and Reality* has turned gradually but surely to idealism. Alexander at least finds unity in space-time, a feat in cosmological thinking which most neo-realists do not approach. And while Jeans specifically limits his idealism to mathematical concepts, the larger syntheses of Alexander and Whitehead seek to embrace both moral and esthetic values. (In a sense, however, are not esthetic values, in terms of vibrations,

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sensations, and autonomic reactions subject to mathematical interpretation?) Whether Heisenberg's principle of uncertainty vitiates the principle of causation is, of course, a debatable problem with which both physicists and philosophers must wrestle. Determinism may be interpreted ideally or materialistically. A measure of it as a phase of common-sense realism will obtain as always, but its interpretation in terms of mechanism, at least, will no longer be urged so unanimously. Philosophy, therefore, with the sanction—nay, the propulsion—of physical science returns to cosmology, and for many minds to a form of idealism.

In the Middle Ages a certain kind of spiritual world became, by authority, a vivid reality to all the people—vivid in a sense that few moderns can comprehend. Mechanistic philosophy has reduced most of us today to agnostics, at best. There may be elements in our experience that we can hardly explain in other than spiritual terms but we hesitate to give such explanations a basic position in our thinking; we say, simply, we do not know. In the event that modern science should develop its present idealistic proclivities the spiritual background of the universe may again become a vivid reality but in a new and much broader sense, of course. This influence, active upon the attitudes of people in general for any considerable length of time, could not fail to work profound changes though we need expect no overwhelming transition. It was fifty years after the appearance of Newton's *Principia* before it became thoroughly established in the universities; its complete implications and the deductions which succeeding generations have drawn from it have come to full fruition only recently. Consequently our present evaluations must be full of hazard, but if we can indeed say that the turning in the lane is at hand for mechanism we may look for inevitable results in the temper of men's imaginative approach to life.

I remember well a sermon my rector once preached on St. Paul's phrase, "In the fullness of time." He argued that today we are approaching again the conditions of ancient Greece and of the sixteenth century when the dams of thought broke and the currents of life quickened. Such an age is characterized by certain peculiarities; among them, new efforts at self-expression, at self-appraisal, and at synthesis. Certainly our times are not lacking in these. We must not forget that we have been contemporaries of a group of the

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world's great geniuses—Edison, Lenin, Gandhi, Einstein, and (perhaps) Whitehead, representing five fields of human achievement. Their prototypes are all to be found in the flowering of Greek civilization—in Archimedes, Pericles, Socrates, Aristotle, and Plato—to the genius of whom, however, not all our moderns would measure up. The sixteenth and seventeenth centuries could furnish a similar list—for example, Galileo, Cromwell, Luther, Newton, and Spinoza—though the fact should be recognized that the field of applied science has only lately achieved its eminent respectability and was formerly pursued more or less incidentally. It is noticeable, too, that in formulating these groups of names we utilize progressively expanding areas. Today the influence of the genius may be world-wide, even in his own time. Just as the work of Edison and Lenin have affected Orient as well as Occident, so the work of Gandhi may come, through India's young intellectuals, who seem in large numbers to be fired with the ideal, to its spiritual fruition in both West and East. The artists of this high level, unless we accept Tagore and Tolstoy, are missing—as they need not have been from our other lists—but they may yet appear before we give up our seats in the audience. In many forms of expression, at least, we are clamorous.

As for self-appraisal, the round of European and American critics will give evidence of widespread questioning. Siegfried, for France; Lombroso, for Italy; Spengler, for Germany; Ortega, for Spain; Briffault, for England, to mention only a few, have held Western civilization up to searching criticism. In America we have not lagged. Randall, Beard, the Lynds, Parrington, Frank, Mumford, and a host of others, by summary, by symposium, and by survey have tried to evaluate the accomplishment both of the West in general and of the United States in particular. It is heartening to witness this active taking of stock on the part of thinking Americans. Nor is the trend toward synthesis by any means limited to philosophy. The "outline" movement, following the lead of Wells and Durant, has spread to every field. The desire to reach conclusions, to interpret the wealth of data piled up by scientific research, indicates again that man—even Western man—continues to long for translations of facts into human values. And for these we shall turn rather consistently to idealism.

Idealism insists upon the reality of values. Robinson would trust

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to the cultivation of intelligence and confront that intelligence with scientifically-filtered facts. And this same hope in the efficacy of facts is expressed by Briffault in his *Rational Evolution*:

> Civilized mankind is for the first time beginning to learn—not through the sharpening of its intelligence, but through the insistent hammering of hard facts—that the interests of individuals cannot be served in any secure and permanent manner without taking into account the interests of the whole of mankind.

A science of society, perhaps a century or so hence, will undoubtedly bring a high measure of succor to the human race. But is it fantastic to predict that just as physical science has arrived at a cosmic philosophy which for at least some of its formulators includes values, so social science must ultimately reckon with those human values that cluster about imaginative insights as well as those that inhere in purely factual evidence?

Instrumentalism has had a fine day of it in the United States both in philosophy and in education, and to it we are tremendously indebted. We should err grievously to react from the teachings of science by scorning them (though there appears to be little danger of this); on the other hand, we shall not hail the power of science as sufficient to pry off quite all the Seven Seals. We shall go on striving for outlooks of higher orders as long as man continues civilized. But it seems rather safe to surmise that considerable time will elapse before we reach more significant works than those of the present generation, attempting to bridge the gap between science and metaphysics by way of idealistic syntheses.

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Journalists, Middlemen of Learning

ELMER T. PETERSON
Editor, "Better Homes and Gardens"

THE custom of predicting the collapse of Western civilization is time-honored and the yells of warnings have become so familiar that ears are dulled to them. It seems to be the old story of the boy who prematurely announced the coming of the wolf. And yet the terrific impacts of the economic depression have given recent menace to these predictions. The delay in the wolf's advent does not necessarily mean that he is a remote peril.

Speaking of this crisis, Marlen Pew, editor of *Editor and Publisher*, says that "few know what has struck them," and adds:

> These are among the grave complexes of the day, and while sophisticated persons are familiar with the causes, the rank and file of American society sees only the effects and continues dazed and benumbed. All of which calls for a first class interpretation job in the popular press—simplification in graphic form of these runaway forces. This stuff is written almost exclusively in the technical language of the economist. The man who will make it real to the fellow in the street and woman in the home will go down as the hero of the age.

These words, coming from a highly intelligent leader of American journalism, are gratifying to the writer, who for several years has been saying in a modest and limited forum that the task of interpreting technical matters to the layman furnishes the most inviting single opportunity for journalists which lies in the days ahead, and the journalist who will prepare himself for such a task will have the best chance for success.

It is axiomatic that in order to overcome a difficulty we must first understand it. And since the entire nation must move like an army, it is necessary that the masses understand their own economic situation. If, to avoid repetitions of our present grotesque paradox of starvation in the midst of plenty, technocracy—shall we call it the despotism of the machine?—necessitates a drastic shortening of working hours, limitation of crop production, scaling down or cancellation of war

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debts, new systems of unemployment insurance, and new and more equitable methods of distributing natural wealth, the people as a whole will have to understand why; otherwise such movements cannot be successful, for we do not live under a dictatorship. And even if the schools and colleges should immediately undertake this task, the education of the public, that would not be enough. They cannot anticipate all the shifting problems of ten or twenty years hence. Newspapers, magazines, and other agencies of journalism should also be under the burden, not simply in fulfillment of a social duty, but as an opportunity for a service yielding financial rewards. Intelligence, a good liberal arts education, and the ability to see are the chief requisites.

It should be understood that Western civilization is now taking a drastic drubbing at the hands of some of the very forms of technology that had been hailed as benevolent hand-maidens of civilization. The World War furnished the economic smoke screens, camouflages, and barrages that enabled these Robot forces to race ahead of the human family almost without our realization. Artificial demands were created. Production was feverishly increased. Inventive genius was called upon for greater and greater effort. And for more than a decade the spurt and momentum of artificial prosperity, dependent considerably upon the production and consumption of luxuries, carried the nation along, making us believe that prosperity was substantial and permanent. All at once, in 1929, we discovered that technology had an ugly and menacing side. We had been living in a fool's paradise. The doctrinaires of the Industrial Workers of the World, following Karl Marx, had predicted this paradoxical situation a long time before, but our smug society had paid scant attention. It now becomes the heavy duty of our capitalist society to show that there is a better way to extricate ourselves from the clutches of the machine process than that indicated by the Marxians. The Industrial Workers did not have a workable program. But, for that matter, neither did we who opposed them. I am among those who heartily disapprove the Marxian program, but I discovered, during the World War period, that the Industrial Workers' leaders were doing a better job than any one else in educating the workers in economics. They were interpreting the technique of the social implications of the machine process to tramps, young college students in harvest fields, oil workers—any one

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who would listen or read the numerous pamphlets they carried about with them. But economics is but one phase of the larger discussion.

Technique, for the purpose of this discussion, applies not only to economics, but to scores of other subjects. Each of these subjects has a distinct impact upon civilization, often for woe as well as for weal. Concentration of technical knowledge in small, exclusive groups is bad for society. It makes for exploitation, jealousies, provincialism, and a failure to understand the world that surrounds us.

Not many years ago it became fashionable to say, "This is an age of specialization." This was said with a smug finality which implied that specialists were to be segregated from the common herd. Perhaps we were all wrong if we shared any such implication. This may have been a rather primitive dictum, after all. Probably in the earliest society the unlearned man was under no handicap, for everybody was unlearned. But very soon, as technology and learning were built up, curious phenomena were observed, remnants of which come out of the prehistoric times into the historic by way of traditions and myths.

Pythagoras, one of the early technicians of recorded and authenticated history, was a part of an aristocracy of knowledge which probably began several thousand years before Christ, since he was partially a product of the doctrines of the Egyptian priests and contemporary or previous civilizations. He was thoroughly imbued with the theory that all kinds of special knowledge were in some way related to religion and mysticism, and therefore sacrosanct. His secret society, founded upon the Orphic mysteries, used code words and whispered their choice tidbits of scientific gossip in order that they might not be profaned by circulation among the common people. Fortunately his discovery of the fact that the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other two sides leaked out to the general public and to posterity. Hippocrates, who came upon the scene later, and in another field, doubtless intended to make his technical knowledge available to the greatest possible number, but his "Hippocratic oath," the first recorded medical code of ethics, was the beginning of an institution which, in some degree, has worked against the wide dissemination of his lore. Socrates, not a technician in the strict sense, but undoubtedly an educator, wandered about the market places and sought communion with the masses. Despite his magnificent service to humanity, all he got for his

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pains was an accusation of trying to corrupt the morals of the young and he was finally condemned to death. The golden age of Greece passed, and with it passed one more sporadic movement to make special knowledge and appreciation of the arts the common property of the people. For the most part such accomplishments were considered the sole prerogative of the priesthood.

History, of course, is full of the stories which show the curious and reciprocal hostility between commoners and geniuses. Galileo comes to mind as one of the outstanding examples. Not even the priesthood would take his part. One of his contemporaries, Tycho Brahe, was one of the long lines of technicians misunderstood by the lay mind. Even when he was given the island of Hveen, by King Frederick II of Denmark, and lived what to him was an idyllic existence for two decades, the great astronomer was figuratively and literally insulated from popular dynamics and understanding. Here he erected the castle Uraniborg, "fortress of the heavens," and consorted with the stars. When Frederick died, the frivolous and ignorant courtiers of the new king made life unbearable. His castle and living were taken away.

This modern age of enlightenment, so-called, cannot well jeer at the provincial-mindedness of ancient times which divided the community into mental areas with high walls between. Even now, in many cases, despite the magnificent progress made by our educational systems, the wise men of courage are separated from the people by barriers of professional ethics and by inadequacy of education. Always education, in the broad sense, has been a process of narrowing the gulf between the technician and the layman. If it creates an aristocracy of learning it is not worthy of the name.

As a journalist I am impelled to note the gradual elimination of this gulf, for it happens to be the journalist's lot to build bridges here and there. The process has now gone so far that the greatest single opportunity in journalism for the future lies in the proper interpretation of contemporary technical subjects to the lay mind. Under the term "technical" I include a broad range of subjects—chemistry, music, architecture, electrical engineering, law, cookery, physics, biology, floriculture, medicine, psychology, economics, art, sport—anything that requires a course of specialized study and training.

When the individual is ignorant of the forces about him a satis-

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factory human existence is impossible. Technique has filled our lives with phenomena of invention, discovery, and genius. The veriest layman cannot avoid contact—intelligent or unintelligent—with the fact that certain vitamins prevent rickets, that some musical tones harmonize with each other while others do not, that certain waves may be plucked out of space and transformed into speech and music, that inoculation may prevent disease, that photographs of bones may be made through solid flesh, that the exact path of a total eclipse may be charted a century in advance, that bacteria may assist in bread-baking, that prices cannot be maintained in the face of a surplus, that nitrogen is important to plant growth, that metal conducts electricity, and thousands of other facts. It therefore becomes increasingly important that such phenomena be interpreted to laymen by competent observers who are nevertheless sufficiently removed from the minutiæ to have a sense of the dramatic and a power to view in perspective. As specialists increase in number it becomes utterly impossible for the layman to consult one every time he encounters a problem. He must acquire a certain amount of technical knowledge himself. Otherwise he becomes a helpless atom in a swirl of unknown forces.

With the advent of the so-called "age of specialization," which is really nothing new, after all, since specialists were revered even more in primitive society than now, a corollary was observed—the theory that it was a bad thing to have a smattering of many forms of knowledge. Alexander Pope's formula concerning the perils of a little learning, written two centuries ago, has been sung to many tunes. Now, in this age of technocracy, there is some reason for wondering whether a great deal of isolated and insulated learning is not also a dangerous thing for society.

I anticipate an obvious objection to the procedure of building bridges. It will be said that technique should not be discussed by pretentious reporters who succeed only in being charlatans. Agreed. It is also agreed that men should become more and more learned—more and more proficient—in specialties. The point that I strive to make is that every possible effort should be made to build bridges between the specialist and the lay public. Any good reporter, if he is really good, can build any kind of bridge desired. His very lack of technical knowledge may be an asset. It gives perspective.

In my experience as writer and editor I have found a simple and

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practical method of accomplishing the bridge-building without doing violence to the people at either end of the bridge. My first article accepted by a major national magazine was on one phase of finance, a subject which is really distasteful to me. After obtaining a background of facts I wrote the article with as much human interest as possible, and then had it checked for accuracy by an authority on the subject. As a magazine editor I follow the same procedure, secure a lay writer who is known to be intelligent, have him write on a technical subject with as much dramatic appeal as possible, and then have the material statements checked by an authority, either through the writer or the editorial staff. In this way the journalistic values are preserved without violating truth or learning. If a reporter approaches a technical subject with an intelligent but uninformed mind, he is most likely to suit the lay reader.

As a rule it is very difficult for a specialist to write a popular article on his own specialty, even though he may be a proficient writer in other respects. I once asked a physician to write an article on vaccination. It turned out to be an excellent paper to read before a medical association, but entirely unintelligible to the layman. Likewise I asked an exceptionally competent and intelligent insurance man to write an article on insurance. What he wrote was a sales argument, pure and simple, which would cause the reader to turn the page in disgust as soon as he had read the opening paragraph. A fact often ignored by the technician-writer is that an article is of no use if it is not read. A collateral fact in this connection is that the layman cannot be expected to pounce eagerly upon a technical article as a specialist might. He must be lured into technique by easy stages. The material must be sugar-coated by drama, action, humor, and other journalistic devices grouped under the general head of human interest. The specialist, with his nose close to the subject, is likely to lose his perspective for he knows too much about the subject to write an article that will be easily read and easily understood. He is too prone to judge the reader by himself. Nothing is dryer than archeology. The announcement of the discovery of a Neolithic skull in Minnesota might easily be deadly dull reading, but when it is related that a seventeen-year-old girl was murdered 20,000 years ago and that the crime has just been discovered, the scientific discovery is humanized. A medical report to the high officials of the Rockefeller

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Foundation may sound as exciting as a dictionary, but a skilled reporter might dig out of it a drama as intense and fascinating as the wildest tale of Doyle or Poe.

Some professional associations have short-sightedly suppressed public utterances and writings by their members. Professional jealousies have prompted many instances of this kind. The trouble is that these associations have provided little or nothing to take the place of this very natural and needed service. As rapidly as possible the medieval theory that technical knowledge is the prerogative of the elect should be discarded. With suitable safeguards against charlatanism and the loose excesses of the smatterer type of lay journalist, every possible effort should be made to batter down barriers and build more bridges. Much could be done by professional men and other technicians to encourage the right type of reporting. When they attend meetings dealing with specialty subjects many newspaper and magazine writers feel like interlopers. They are tolerated as necessary nuisances and frequently fail to get the really big news because so many of the eminent technicians think of publicity as a more or less painful joke. Then when a reporter writes a garbled or inaccurate story the technicians blame him, whereas they should blame themselves, since he can grasp only bones and crumbs from the feast.

A significant straw in the present wind is the new project in adult education, initiated by the Carnegie Corporation last November, in response to a suggestion by J. W. Studebaker, superintendent of schools at Des Moines, its object being the discussion of economics, international relations, business practice, or anything else that is indicated by the expressed desire of those attending. This will not be a night school to remedy deficiencies in common or high school education, but a supplementary institution for adult minds, and will deal with those larger and constantly changing problems of society which are now the business of the masses. In the words of the prospectus, "the purpose of the plan is to demonstrate whether or not the adults in DesMoines can be vitally interested in discussion groups organized under the auspices and direction of the public schools of the community and for the consideration of pressing problems of our modern, complex society." It is obvious from the prospectus that an effort will be made to interpret technical subjects to the lay mind.

Nearly every person in the United States has some view upon the

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subject of war debts. But how many persons really understand the war debts? How many laymen have even a faint inkling of the economics of the situation? It is entirely conceivable that, because of the drain upon the buying power of foreign countries for American products, insistence upon payments of the war debts might mean financial disaster to the United States. If people are to vote upon such subjects, directly, or indirectly through legislative candidates, they should be informed. This is just one of a thousand instances which show that technology has outrun human currents and is in danger of extinguishing or vitiating human life and welfare. We are in the grip of extra-human forces that we as a nation do not understand.

Journalism, at this juncture, has a weighty obligation. As printing has been called the art preservative of all arts, so journalism may be called the profession preservative of all professions and of a well-ordered society, considering journalism, of course, as a supplement to the education of youth in the schools, colleges, and universities—which education, of course, cannot well be planned to meet the shifting problems of the decades ahead.

Technocracy is here. The question is: Will it help or destroy us? What are we going to do about it? Are we going to let the more ingenious specialists live and let the devil take the hindmost—the general public? The problem is double-barreled. One phase has to do with the welfare of the millions of non-technical unfortunates who are crowded out of employment, due to the triumph of cold, unhuman technique. The other phase has to do with the education of the masses of the people, to the end that they may vote and exercise intelligent pressure for the reduction of working hours, for unemployment insurance, limitation of crop production, adjustment of foreign debts, improvement of financial technique, and other measures for taking up the present slack. The first phase has to do with such education of the lay public in all forms of technology that they may adjust themselves to the forces about them, thus becoming more proficient in earning power and happier through general culture. The second phase has to do with the education of the general public in the single item of economics, mentioned by Mr. Pew at the beginning of this article. If journalism will meet this crisis adequately it will not only fulfill a moral obligation to society, but it will also reap rich rewards in a service for which the world is crying.

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Editorial

University in Exile

THE recent expulsion from the German universities of professors regarded by the Nazi government as obstacles to its program of a unified "pure German" state, acting under minority direction and thinking in secret if at all, has had one salutary consequence, the world-wide awakening to the fact of international solidarity of scholarship. England, the mother of modern liberty, is distinguishing herself among nations by her generous hospitality to the exiled German intellectuals. The political science faculty of the University of London has levied upon itself a tax on salaries in order to maintain visiting professors selected from among the exiles, and a number of other universities have drawn upon their too slender budgets for the same purpose. France has made a place for a number of these scholars; and even countries commonly regarded as backward, such as Jugoslavia, Turkey, Latvia, Fascist Italy, are doing their part to proclaim the international interest in intellectual freedom.

In spite of the depression and the consequent drying up of philanthropic funds America is extending aid to the cause of academic liberty with a generosity fairly comparable to that of England. An Emergency Committee in Aid of Displaced German Scholars has raised funds sufficient for the placement in American universities of some fifteen German professors. Other movements in the several universities will increase the number to at least twenty. The New School for Social Research has launched a movement for the creation of a "University in Exile" as a permanent supplement to our educational system. It has raised funds sufficient to take care of fourteen visiting scholars through a period of two years. Down to the present it has confined its activities to the social sciences, because of the necessity of concentrating its limited resources in such a way as to produce an effective educational unit. Of the fourteen men who are to form this faculty of political and social science the names of ten have been announced. They are: In economics, Emil Lederer, Eduard Heimann, Karl Brandt, Gerhard Colm, Arthur Feiler; in sociology and social work, Hans Speier and Frieda Wunderlich; in psychology, Max Wertheimer; in anthropology and musicology, E. von Hornbostel; in jurisprudence, Hermann Kantorowicz.

For more than a generation American professors have advised their graduate students to spend at least one year in a German university, in order to familiarize themselves with German methods of instruction and research. In the present disturbed condition of Germany the student can expect little profit from residence in a German university. The "University in Exile," officially the Graduate Faculty of Political and Social Sci-

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ence of the New School, aims to supply this defect in the system of training for political and social science. The faculty, which consists of quite as eminent men as were ever assembled in a German university, will be self-governing, as in the German university in the period of its greatest glory. It will function exactly like a German university faculty. Instruction will be in English, except for two courses which will be given in German with English summaries and translation of difficult passages.

ALVIN JOHNSON.

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The Whole or/and the Parts

THE profoundest purpose of THE AMERICAN SCHOLAR, that which tends to give it fundamental unity and direction, is perhaps the effort to synthesize knowledge into a meaningful whole, into a philosophy of life or world-view. An understanding of the meaning of the whole of reality is vital because it contributes much to an appreciation of the full significance and value of the parts, particularly the parts which constitute our daily life. Paradoxically, however, we can grasp the whole only by grasping the parts. A reciprocal process, therefore, is necessary if knowledge is to advance most securely.

THE AMERICAN SCHOLAR does not propose to offer only ready-made philosophies but chiefly the materials of which philosophies must be made. Gradually, as competent authors can be found and space permits, the various data available from the many areas of human experience will be presented intelligibly and interestingly. The successive numbers should carry such materials of thought as psychological analyses of the mind, particularly the knowing process; non-technical accounts of scientific facts and theories which may have general significance; descriptions of individual and social experience, particularly of esthetic, moral, and religious values; and historical and comparative studies which give perspective and universality to judgment. The order in which the mind receives such material is not important, for the mind must accumulate data until it can see each in its relations to the rest and see all *sub specie aeternitatis* and as simultaneously as the elements of reality exist in nature.

In order to assist in the synthesizing process and yet advocate no particular philosophy, THE AMERICAN SCHOLAR will present from time to time not only limited correlations including such realms as chemistry and biology or esthetics and physics but more inclusive systems of knowledge such as theories of value, social philosophies, cosmologies, and metaphysics. These syntheses will represent the points of view of various religions and such general philosophical attitudes as idealism, materialism, realism, and pragmatism.

Both the scientific data and the typical philosophical syntheses will be presented in terms readily understandable by any person of good general education. The thoughtful reader who follows THE AMERICAN SCHOLAR regularly may expect to de-

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velop, even almost unwittingly, a more or less unifying world view. Such a result cannot of course, and perhaps should not, come quickly. Not all readers, moreover, will arrive at the same interpretation, for individual temperament and experience are determining factors, but each reader may find help in arriving at a more satisfying philosophy of his own, a necessity if a life is to have purpose, direction, and profound happiness.

This is not the only objective of THE AMERICAN SCHOLAR but it is one which strikes at the most basic and vital need of modern man. Even our greatest educational institutions suffer from the scrappiness of knowledge and the extreme difficulty of attaining unarbitrary unity. The quarterly visits of THE AMERICAN SCHOLAR should stimulate that evolutionary or progressive attitude of mind which finds harmony and happiness in the faith that it is advancing on the right road and that it can discover and interpret the successive sign posts as they occur.

WILLIAM ALLISON SHIMER.

Dr. Henry Suzzallo

IN the death on September 25 of Dr. Henry Suzzallo, THE AMERICAN SCHOLAR, Phi Beta Kappa, and the cause of scholarship generally lost a strong friend. His constant fight was for the type of education which teaches men to think. All other motives, he believed, must be subordinated to the need for minds capable of discovering problems and dealing with them in the disinterested and effective manner of the true scientist.

Although Dr. Suzzallo had served as a Senator of Phi Beta Kappa for only two years, his ideals were already bearing fruit, particularly through his service on committees seeking to discover better criteria of scholarship, not only for use in the selection of students for membership, but in the designation of colleges for the establishment of new chapters of Phi Beta Kappa. In the society's increased devotion to the highest purposes of education, and at innumerable other points in our national life, Dr. Suzzallo's spirit will carry on.

WILLIAM ALLISON SHIMER.

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Business Education and Economic Responsibility

LEVERETT S. LYON

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BUSINESS education is often described as one of the newer forms of vocational training which have within recent years tended to replace instruction in "culture." Such a view excludes by definition a social responsibility for any form of vocational education. Such a concept of business education renders extraneous any thought on the social implications of this vigorous and growing form of instruction, and is in error on two counts.

Training for economic activity is, as a matter of fact, neither new nor unrelated to the most significant elements in social organization. Anthropologists have reported no group, however different from ours in habits of life, which does not train its members in such practical phases of social life as work and war and in the performing of these social activities in such a way as the tribal customs and taboos declare socially desirable. Plato and Aristotle, particularly the former, advocated a training consistent with the idea that life was a series of relationships between the individual and his group, and taught the desirability of training that should make each man a "guardian citizen of the state." In the decline of such training Plato foresaw serious dangers to the preservation of Greek culture and life.

The apprenticeship of the medieval guilds, always recognized as a training in technical skill, was likewise a device for introducing the novitiate into the difficult economic and social environment of his time. The master craftsman performing in medieval life the several functions of technician, employer, legislator, public citizen, and often of municipal officer, was bound under the clauses of the indenture to instruct the novitiate in his charge well and fully, not only in the manual skills requisite to his vocation but in its contactual aspects as well. Living in the guildsman's house, associated with him every day in his shop, hearing him discuss his manifold problems with fellow craftsmen of the same interests, the apprentice inevitably came to an understanding of the social opportunities and responsibilities of that organization of economic life which the guild represented.

It is only in comparatively recent

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times that training for vocations and training for social responsibility have tended to be separated. This separation was a part of the emergence of business as a means for organizing industry. In those great economic changes which came with the break-up of the medieval system of gaining a livelihood the most significant emerging element was the new responsibility seized upon by individual enterprise. Agricultural economic life in England shifted from a system of production for consumption to a system of production for a market; production for sale. Manufacturing was transformed from a plan of guild organization, highly regulated and closely joined to the city government, to a scheme which permitted individuals to undertake the organization of such parts of economic life as they might volunteer to organize. The individual organizer, the enterpriser, thus became the central figure in industry. He was the business man, and with his coming, business in the sense in which we now use the term became dominant in the economic organization of the Western World. Well established in England by the middle of the eighteenth century, the business system was transported bodily to America and, in our environment of vast resources and a philosophy of independence and free thought, flourished mightily.

Business as a scheme for organizing economic activity is an interesting and curious paradox. It permits an individual to utilize such parts and such kinds of social resources as his finances will command. He may take raw materials, labor, funds, equipment, if he can buy or hire their use, and turn them to the production, with few limitations, of whatsoever he will. Or he may withhold them from production. How can a society rationally grant individuals such extensive power? It is done on the theory that the business man will do what it will be most profitable for him to do and that in doing what it is most profitable for him to do his interests and the interests of society will be made coincident. It is a philosophy which believes that through selfishness the greatest social good will result.

With such a philosophy it is not strange that the beginnings of business education in the United States should have been confined to techniques of the narrowest kind. While survivals of apprenticeship played some part, the earliest formal business education was that given by the so-called penmen, who were making their appearance early in the eighteen hundreds. The demand for clerical training throughout the nineteenth century was tremendous and expanded with almost unbelievable activity. The original territory of the colonies was doubled by the Louisiana purchase, and by 1853, with the addition of Florida, Texas, and the Oregon claim, the Mexican cession, and the Gadsden purchase, had doubled again. Between 1820 and 1850 the population of nine new Western states in the Mississippi Valley had increased more than 300 per cent, creating for Eastern manufacturers a market which had been undreamed of before. In reaching this market with the newly developed factory products there was a demand for all the facilitating processes of

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business. Letters must be written, transactions recorded, reports rendered, calculations of numerous sorts made, estimates and proposals computed and presented. This work did not demand great intelligence, enterprise, or initiative, but it required accuracy and exactness in the performance of clerical tasks. In response to the demand for teaching such work there evolved the itinerant penmen, the penmen then developed into the business college, and the business college became the chain, the most famous of which, the Bryant and Stratton chain, was founded in 1853. There is disagreement as to who established the first business college. The claims of R. M. Bartlett, first of Philadelphia and later of Pittsburgh and Cincinnati, are disputed by the champions of Peter Duff of Pittsburgh, G. N. Comer of Boston, and Jonathan Jones of St. Louis, as well as by those of Dolbear and Bennett, the last of whom announced in 1824 that he was opening in New York "a school for the instruction of young gentlemen intended for mercantile pursuits."

In the public secondary schools the early nineties saw technical business training, imitative of the business college, in process of development. From slightly over 15,000 commercial students in the public high schools in 1893 the number grew in 25 years to 278,000, an increase of more than 1,700 per cent.

Finally the collegiate school of business appeared. Following the establishment of the first of these, the Wharton School at the University of Pennsylvania, in 1881, no other was founded until 1898, in which year both the University of California and the University of Chicago announced schools of commerce. The real growth of these institutions followed 1915, when universities established them so generally that reports now indicate that there are not far from 500 universities or colleges giving some form of business work, and as many as 70,000 students taking business work at the collegiate level.

But in contrast to the philosophy of the guilds, in no part of the American business-education system has there developed a definite ideology of training for social responsibility. The business college has no interest beyond the teaching of those clerical techniques, training for which can be sold at a profit. The commercial training in the secondary school has very largely run true to its pattern, the business college. The collegiate school of business has developed primarily upon a philosophy of management, management in the sense of organizing and directing a single business for the purpose of profit.

Yet there has recently been a distinct dawning of new light; there have been definite indications that business education is about to enter upon a new era with a new social vision which will see business in a truer perspective and will view social welfare not merely as a desired incident of business activity but as a direct aim and objective of business.

In no single type of business institution is this change forecast so certainly as in the collegiate school of business. In evidence recently collected from all the members of the American Association of Collegiate Schools of Business as to what could

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be foreseen in the next ten years, no single subject was more frequently mentioned than the desirability of increased emphasis on economic as distinguished from technical training. The words of one dean expressed the thought of many:

"The general curriculum of the collegiate school will come more and more to emphasize the broader philosophical aspects of business and particularly its social responsibility."

In the secondary schools as well there is an increased interest, spurred actively in a few educational centers, in making the secondary school business courses something else than clerk mills, in making them the "college of the people" which they were years ago declared to be, colleges which see an opportunity for that new type of culture which is essentially an understanding of the social institutions of the world in which we live.

That there lies before business education a magnificent opportunity for service is clear. The same service might be undertaken by other divisions of education—law, history, political science. But the newness of business as a phase of formal instruction, the lack of binding traditions, and the dawning recognition of the responsibility of business to society, all press upon the leaders of business education an obligation to assume a leading rôle in a new type of social teaching.

If business education is to undertake directly and simply to prepare for social responsibility, what should be the chief elements in its new charter?

The first requisite is that business education shall make crystal clear to each of those engaged in its teaching and study the fact that business education must be economic education; to make crystal clear the rôle which business plays in modern society. The *sine qua non* of business learning should be to know what it is that is being studied. This is not advocacy of the theory that there should be laudation of business, that there should be flattery of the work of business men. It is advocacy of the theory that there should be understanding of business as an organizing agency of economic life. It is advocacy of the theory that we should understand that business does not exist for itself, but is merely a device which society is using for the accomplishment of social purposes; that business has social justification for existence so long, and only so long, as it demonstrates that it can carry its social rôle better than any alternative agency; that business may be expected to continue and can claim the right to continue only as this plan of organization gives to society as large a supply of desirable goods and service at as small an outlay of effort as we could hope otherwise to secure; and that it does this as continuously and as satisfactorily as any other system might be expected to do. Probably no system could do it with complete satisfaction to all concerned. It is unfair to contrast the business system—socialism, communism, fascism, or any other system—with the ideal, but quite fair to compare these systems with one another.

The second requisite is that business education make crystal clear the rôle of governments in economic organization. To these—national,

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state, and local—we give, as we have to business, a responsible task in organizing economic life. These produce for us protection, education, recreation, that subtle service called justice, as well, often, as such tangible goods as water supply and the mechanics of local transportation. A proper study of governments presents vividly to the business student, government as a possible alternative to business as an organizing device. The comparative attitude of mind thus created will see socialism, communism, and fascism in intelligent comparison with our own coordinating agencies.

A third requisite is that business education shall undertake to furnish society with able organizers who shall operate, perhaps in the realm of business, perhaps in the realm of government. Public administration and business administration require, as England has to a degree recognized, the same basic preparation. Men in business need to know the paraphernalia of business administration. Men in government need to know the paraphernalia of nominations and elections, but both need to be competent economists. It is as business men are competent economists that they are lifted above the rôle of petty shopkeeper to the rôle of captain of industry in the best sense. It is as those in government are competent economists that they are lifted above the rôle of small politician to statesmanship.

A fourth requisite is that business education shall lead students to an intelligent understanding of the political, social, and economic problems that arise from the imperfect organization of our economic life. In large measure these problems are phases of our business activity. All would agree that the trust problem and the transportation problem are essentially business problems. But in more pervasive difficulties, such as the management of banking and the currency and protection against unemployment—the most distressing of all our current ills—business and governmental issues impinge and intertwine inextricably. But whether we view our so-called problems as business, economic, social, or governmental, their roots are imbedded in our methods of organizing economic life.

A final requisite of a socially responsible business education is that such training shall make occupations meaningful, intelligible, and significant to those who work in them. Modern economic life is the most extensive scheme of cooperation undertaken or achieved since the beginning of time. The work of each of us is joined cooperatively not only with others in our own schools, factories, offices, and banks, but the work of all such units is likewise cooperatively joined. This cooperation is city-wide, nation-wide, and international. In the days of simple industry it was easy to discern, but the intensity of specialization, the magnitude of scale, the development of technology, have obscured the vision of the individual and rendered him a lone, separated unit, in a world with which he has a million active contacts. It is, therefore, most important among the social purposes of business training to bring clearly to the view of individuals the unity of modern eco-

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nomic life, the dependence of each man upon others, and the way in which that dependence actually works. Each must see his task in relation to the whole. Business education is confronted with a challenge —to prevent specialization and machinery and magnitude from devitalizing intelligence and character as aspects of work.

"If industry kills, education cannot make life." Education must strive to make us in our most continuous activity, the earning of a livelihood, so sensitive to implications, so aware of the social meaning of our acts, that making a living is not merely a preliminary to the practice of culture but is a practice of culture in itself.

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College and University Teaching: A Report

THE American Association of University Professors published during the summer a report growing out of a comprehensive survey of college and university teaching. This report, after touching on a number of subjects such as Present Facilities for the Selection of College Teachers, the Relation of Teaching to Research, and the Teacher's Security of Tenure, proceeds to a brief discussion of the Committee's findings. Among other things the Appendix lists the questions prepared by the Committee and submitted for discussion to the chapters of the Association, and the questionnaire used in the evaluation of courses and instructors by students at the University of Washington.

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A Motif-Index of Folk-Literature

THE enormous task of cataloguing and classifying the motifs of folk-literature over the entire world is represented in a five-volume work just completed by Dr. Stith Thompson, folklore-scholar, Professor of English at Indiana University. This *Motif-Index of Folk Literature* reduces the traditional narrative material of the world to a definite order and provides a common basis for the systematic arrangement of the whole body of traditional literature. Dr. Thompson, for example, studying the taboo motif in folk-literature, cites more than fifty pages of references to this motif in the tales, ballads, myths, fables, and legends which have been handed down from generation to generation.

From the modern ballads of the American cowboy through medieval civilization to the myths of antiquity, Dr. Thompson has collected and classified elements or themes by a simple system of numbered references which permits indefinite expansion as other motif sources are dug out by scholars. The author plans supplements as needed.

Among others, Professors Jan de-Vries of Leiden, Dr. Albert Wesselski of Prague, Dr. Reidar Th. Christiansen of Oslo, and Professor Kaarle Krohn of Helsingfors have collaborated in the preparation of these volumes.

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A. A. A. S.

BURTON E. LIVINGSTON

General Secretary, American Association for the Advancement of Science

THE general purpose of the American Association for the Advancement of Science, with its office in the Smithsonian Institution, Washington, D. C., is broadly indicated by its title, but the present connotation of those words is not immediately clear. Founded eighty-four years ago, at Philadelphia, and patterned in many respects after the older British organization of similar name, the American Association has continually adjusted its aims and efforts to current needs, although its general purpose has remained unchanged. Geographically, its efforts have never yet succeeded in warranting the use of the term "American" in any but a very limited sense. It has purposed to represent and to further scientific advance in North America, but circumstances of language, communication, and transportation have thus far limited its purview almost wholly to the United States and Canada. It does, however, represent North America north of the Gulf of Mexico, the Rio Grande, and the Gulf of California, and it has held several meetings in Canada.

Originally this organization constituted just a cooperation of individuals interested in the advancement of fundamental natural science. Subsequently it has become, in addition, an organization for the cooperation of the numerous special scientific societies that have been and are being formed, and its fifteen sections now embrace, at least nominally, almost all fields of scientific endeavor, including the applied sciences and scientific arts as well as the fundamental sciences. The present sections are named as follows: A (Mathematics), B (Physics), C (Chemistry), D (Astronomy), E (Geology and Geography), F (Zoological Sciences), G (Botanical Sciences), H (Anthropology), I (Psychology), K (Social and Economic Sciences), L (Historical and Philological Sciences), M (Engineering), N (Medical Sciences), O (Agriculture), Q (Education). Each section has a democratically organized section committee which has charge of its work. It will be observed that the first nine sections are for fundamental or "pure" sciences of the natural and exact group, while Section K and Section L are but vaguely defined and the last four represent scientific applications. But this observation fails to emphasize that, since knowledge increasingly refuses to be penned by word fences, these section names are mainly just roughly indicative rather than sharply definitive. For example, physics and chemistry deal much with mathematics, astronomy and geology deal much with physics and chemistry, anthropology and psychology are closely related to each other and to sociology and philology. Engineering embraces research in mathematics, physics, chemistry, astronomy, geology, and even the biological subjects. Medical science leads to fundamental study in the biological fields as well as in physics and chem-

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istry, and agriculture is even broader than medical science. The science of education both contributes to psychology and applies it. Really, the sections of the Association simply represent in a rather impressionistic manner the generally current primary classification of scientific knowledge, and the Association is naturally not responsible for such things as, for example, that the fundamental science of physiology appears dispersed through sections F, G, N, and O. The logical difficulties that arise are, however, partially overcome through what amount practically to subsections, namely the special science societies or their subdivisions, or just by such a sorting of the papers presented at a meeting that related papers may be read at the same session; and different sessions at the same meeting and in the same section may deal with different aspects of the general subject represented by a section or society.

The Association roll bears the names of thousands of men and women who are not professionally engaged in science but who are intelligently interested in the advancement of knowledge. Such people are and always have been cordially welcomed as members. Those who have advanced science through research or who are professionally engaged in science teaching, in research, or in guiding research are eligible to fellowship. The control of Association affairs rests almost wholly with the fellows, for the members of its legislative body, the council, must nearly all be chosen from among the fellows. At the close of the last Association year the total membership was about 17,000, of whom about 40 per cent were fellows.

Throughout the last four or five decades independent special scientific societies have developed rapidly and new ones are continually formed. These naturally deal with restricted fields of science or with restricted aspects of a science and result from the disintegrating trend of specialization. In many instances they have arisen from Association sections but are wholly autonomous. To maintain their connection with the Association the latter established the relations of official association and affiliation. Associated organizations are those that have been officially approved by the Association council. A large number of associated organizations are officially affiliated, by act of the council, and all of these have representation in the council, thus taking part in the control of Association affairs. Official association, including affiliation, usually results from application by the societies, but the council sometimes invites a society to become affiliated. There are now 112 associated organizations, of which 75 are affiliated. As a consequence of this affiliation many thousands of individuals, although they are not on its membership roll, have contact with the American Association. In this manner the Association actually represents, either through membership or through society affiliation, a large portion of the science workers of this country. It aims to further their work in every feasible way, whether they are A.A.A.S. members or not. As an illustration, the rules for the award of the annual American Association prize of $1,000 specifically state that

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the persons elected to receive the prize need not be members of the Association, nor do they need to be members of any associated organization.

Only members of the Association pay any dues to it, and they receive, on account of their membership, the official weekly journal, *Science*—or they may take the *Scientific Monthly* instead, if they so desire, the latter being less technical. Libraries and institutions may be members. Associated societies, whether affiliated or not, make no financial contributions to the Association, nor do they assume any responsibility to the Association, excepting to name their representatives. The 26 affiliated academies of science, which are local organizations with scope similar to that of the Association, receive small annual financial allowances from the larger organization, these allowances being apportioned according to the numbers of Association members enrolled in the respective academies. In the aggregate these allowances amounted, in 1932, to $1,700.

As indicated by the Association sections, the word *science* is used in a very broad sense; it includes mathematics as well as nature study; social science, economics, history, and philology as well as the biological sciences and earth sciences; engineering, medical science, agriculture, and education. In earlier years interest was mainly in the fields of biology and geology, but the exact sciences and the physical sciences are now just as strongly represented. So, also, are psychology, anthropology, and the applied sciences. Only recently have the sections for history and philology and for social science and economics been notably represented, but they are now growing more vigorously. At recent meetings there have been sessions dealing with the history of science and with linguistics, but devotees of history and philology in the broader sense are not yet active in the organization. Recent development in the direction of sociology and economics has been pronounced.

As used in the name of the Association, *science* should be taken to mean the whole realm of knowledge —descriptive, observational, experimental, inductive, deductive. Emphasis is on the "scientific method" of securing and weighing evidence, of correlating facts and discovering relationships. Charlatanism and chicanery, such "pseudo-sciences" as astrology and magic, primitive superstition, such forms of prejudiced or reactionary opinion as are suggested by anti-evolution, anti-vivisection, dogmatism—are unscientific things to which the American Association is naturally opposed on principle.

Through several different lines of effort the Association aims to advance science. In the first place, its official journal is an open forum and a news sheet for brief announcement and discussion in many fields. It is published weekly, being thus continually active in facilitating the spread of new knowledge and in the cultivation of a broad appreciation, among all science workers, of current thought in the several sciences. It serves very effectively to bring to teachers and investigators in one field something of the problems and results that pertain to other fields. By its perusal, for example, a mathematician may learn

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of newly found diseases of plants and animals, or a botanist may become somewhat acquainted with the current study of electrons. Such an integrating or synthesizing influence is of very great value in counteracting some of the undesirable effects of specialization.

One of the Association's main activities is the holding of large gatherings of scientists. There are now two of these each year, one in the week of the Christmas holidays, the larger and more comprehensive of the two, and the other in the summer. These meetings constitute a proved means of disseminating scientific knowledge and stimulating scientific study. Each meeting brings together from distant places several thousands of science workers of all sorts, furnishing opportunity for making and renewing valuable personal contacts as well as for the spread of ideas. Scientific societies are invited to meet with the A.A.A.S. and many of them do so either regularly or at intervals. The Association makes preliminary arrangements for the meetings, issues preliminary announcements in its journal, publishes a general program (which includes the programs of the societies meeting at the same time and place), and arranges numerous general lectures and joint sessions of two or more related organizations. The general program is a book of several hundred pages, supplying a convenient cross-sectional view of current scientific interest in the United States and Canada. The number of papers and addresses listed for recent winter meetings has been from about 1,500 to about 2,000; the number of sessions has been from about 100 to about 250.

The meetings are held in partially irregular rotation at different cities in the United States and Canada. Recent winter meetings have been held as far west as Kansas City and Minneapolis, as far east as Boston, as far north as Toronto, and as far south as New Orleans. Only two summer meetings of the present series have been held, one at Pasadena, California, and one at Syracuse, New York. In June, 1933, the summer meeting was held at Chicago in conjunction with the Century of Progress Exposition.

An interesting feature of the winter meetings is the award of the American Association prize of $1,000, given to the author of an outstanding paper presented on the program. There is no submitting of papers in competition for this prize and the committee on prize award makes selection from the general program with the aid of the secretaries of the sections and societies.

There are many demonstrations at Association meetings and a general science exhibition, embracing both research exhibits and commercial exhibits, is held in connection with each winter meeting. This furnishes unusual opportunities for those who attend to improve their acquaintance with new forms of research apparatus, new research methods, newly published scientific books. It also provides a pleasant and stimulating social center for the meeting where individuals may come together informally.

In several ways the Association

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promotes appreciation of science among intelligent people not engaged in science work. At each of the meetings it arranges a number of semi-popular or popular lectures, in non-technical language, given by eminent science workers who are able to speak with authority. Such lectures are a means of direct contact between science workers and the "laity" but they are mainly effective through the press. The efficient A.A.A.S. press service furnishes to the press and to news syndicates accounts of these lectures, and also of hundreds of scientific contributions presented at the meetings, material latterly in very great demand. Many press representatives attend the meetings to secure and transmit science news stories, which make up, at the times of the great winter meetings and thereafter, many hundreds of columns in the dailies of the United States and Canada. Of course it is not expected that the general public will gain any considerable technical scientific knowledge in this way. The press service aims, however, to encourage interest in the facts of science and to facilitate the spread of an appreciation and broad comprehension of the fundamental nature of science and the scientific method, of what science has done and is doing to improve human life.

A considerable endowment has been accumulated from gifts, bequests, and life-membership fees, and this is kept invested by the treasurer of the Association. The average rate of treasury income for the year ending September 30, 1932, was 4.8 per cent, computed on the basis of actual cost of securities or their appraised value at the time of their acquisition. Income from endowment is used according to the terms of gifts and bequests. In recent years an annual appropriation of $3,000 or $4,000 from available treasury funds has been allotted as small grants in aid for scientific research, and additional funds from the same source have been disbursed for special projects. The current expenses of operation are paid from the permanent secretary's funds, derived mainly from annual dues.

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Vocational Guidance in Engineering Lines

A RECENT publication of the American Association of Engineers, *Vocational Guidance in Engineering Lines*,* a non-technical and non-commercial survey of the entire field of engineering, containing brief descriptive chapters concerning each of the nine major fields in engineering and of the forty-odd specialties, could be invaluable to prospective engineers and to others interested in gaining an authoritative idea of the whole field. The book, written by approximately fifty well-qualified specialists, and plentifully illustrated, has been compiled with a view to providing such a basic description of the work, qualifications, and skill demanded in the profession as to attract into the field only those students competent in ability and temperament, and to discourage all others from entering a profession to which they would be unsuited.

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Opportunities for Research Work in China

CHARLES L. BOYNTON

INQUIRIES regarding opportunities for graduate and research work in China have elicited replies from North, East, Central, and Western China which afford a representative view of the field. Higher educational institutions in general are very limited in number, in personnel, and in equipment, and there is somewhat general agreement that post-graduate work of the American type is beyond available resources and of questionable value in China at present.

The outstanding exceptions are the work in agriculture at the University of Nanking, the opportunities in Chinese cultural subjects at the North China Union Language School at Peiping, and the graduate School of Yenching University at Peiping, limited to one hundred students with work in biology, chemistry, Chinese, economics, education, history, philosophy, physics, psychology, and sociology. Attached to this latter also is the Harvard-Yenching Institute endowed for promoting sociology both at Harvard and at Yenching, with a number of graduate fellowships for students.

It may be pointed out that the mastery of Chinese offers access to more new material than is offered the American student who masters French, German, Italian, or Spanish. This is true because most of the valuable material in those languages has been translated into English, while relatively little of the material offered in Chinese has been made available in any foreign language. The largest book in the world is the encyclopedia of Chien Lung. A full set of it exists now in the Metropolitan Library, Peiping. It is comprised of more than 36,000 volumes and is stored in one large room in 6,000 cases where it is available for work by serious students. The index alone, which is found in all the libraries in China, is a very valuable work in several volumes. It is commonly believed that in 1750 China had more books than all the rest of the world combined and that in 1850 she still had more books than any other one country. The above mentioned encyclopedia, which is much the largest of all the encyclopedias of China, is only one of more than 2,200 Chinese encyclopedias.

The Academia Sinica in Shanghai and Peiping, the Academy of Peiping, and the Geological Survey may be mentioned. They are not teaching institutions and do not take in students, but their facilities are available under special arrangement.

China is a virgin field for research. In any field it offers great opportunities for study. The facilities for research are limited, and scholars from abroad would be greatly handicapped without preliminary work in the institutions named, at Peiping. On the other hand the United States Department of Agriculture, the Smithsonian Institution, the United States Department of Commerce, as well as the Army, Navy, and State Departments constantly maintain representatives in China studying the as-

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pects of this country which are of significance in their fields. From time to time such expeditions as those led by Sir Aurel Stein, Dr. Sven Hedin, and Dr. Roy Chapman Andrews bring groups of a dozen or more scientific workers to this country for investigations.

Not to be ignored are the quiet research projects being carried on by missionaries, business men, and consular officials in cultural, economic, geographical, and medical lines, as well as in the subjects immediately pertinent to their livelihood. No alien group in China is so predominantly college trained as the American and the majority remain intellectually alive.

. . .

The Bassae Frieze Reconstructed

LILLIAN GREEN

Out of 6,952,802,024,320,000 possible arrangements of the frieze lining the interior of the Temple of Apollo at Bassae (only six of which have been tried and those with unsatisfactory results), one both logical and unique, though not conclusive, has been constructed by William Bell Dinsmoor. By proceeding from a study of the structure rather than the content of the sculptured marbles, now in the possession of the British Museum, Dr. Dinsmoor has made a valid, scientific tool of an approach which seemed superficial. In completing the enormous work entailed in fitting the holes used for fastening the frieze (in London) to the architrave, with those in the architrave and backer blocks (at Bassae), he has so restored a work of great beauty that it stands perfectly related to its architectural environment and without incongruities of content—an achievement of real significance for modern archeology, both in the thing restored and the method used.

. . .

Erratum.—Vol. II, p. 366. The following sentence, showing explicitly the relationship between Mr. Abraham Flexner's Institute for Advanced Study and the work of the Huntington Library, was unfortunately omitted at the end of the first paragraph:

"The Huntington Library is performing for pure scholarship a service similar to that in which Mr. Flexner feels the universities are failing."

. . .

Phi Beta Kappa Contributors to This Issue

Charles Boynton, Pomona 1914.
Alvin S. Johnson, Nebraska 1897.
Jay C. Knode, Nebraska 1908.
Albert William Levi, Jr., Dartmouth 1932.
Burton Livingston, Johns Hopkins 1931.
Gairdner Moment, Princeton 1928.

Erratum.—Vol. II, No. 3, p. 381: S. E. Harris, listed as ΦBK Princeton 1917, is not a member of the Society.

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Discussion

The Failure of the Liberal College

ALBERT W. LEVI

Among many of us who have been graduated from American colleges during the past few years and in particular among those who have bid farewell to academic halls this June a definite spirit of disillusionment prevails. And it is a disillusionment which is perfectly understandable.

For four years we have sat patiently in the classroom, if not making a feast of knowledge at least picking up the scraps, if not straining our ears to catch each last dusty word at any rate making an honest attempt to gain for ourselves a modicum of the advantages which a liberal college purports to offer.

During this time we have lived softly and without fear. Sheltered within the bosom of the academic environment our problems have been comparatively simple, our daily life made easy. And now that these peaceful days are over we are forced to turn to a stranger and a harsher reality—to this "brave new world" of unemployment and poverty and depression.

For many the cause of uneasiness and disappointment is to be found in the present sad financial state of the nation which makes it impossible for the majority of recent graduates to make the occupational adjustments toward which they had been looking forward. But for a certain small, but none the less clearly discerning, group this dissatisfaction with the process of education as exhibited in the undergraduate college, and particularly the college which terms itself "liberal," has deeper and more universal roots.

What troubles this group most is not the immediate economic situation which experience has shown to be cyclical rather than lasting, but the more permanent conditions of American college education itself. That which is really disturbing is not the rather pale and greyish outlook of the material future but the specter of their own moral incompetence. For they realize that four years of the sort of education to which they have been subjected has given them neither a grasp of the fundamental principles of life and the way it is lived or a world-view wherein is reconciled all their contradictory impressions of a bewilderingly complex world.

We can hardly blame the liberal college entirely for the lack of a satisfying philosophic outlook, for such an outlook cannot be gained by a four-year participation in the life and activities of a college, but instead is the result of years of constant attendance upon the drama of existence, and only to be achieved in the passage of time. But the underdevelopment of a moral sense is something quite different —something not only alarming in its

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implications but to be laid directly to the laxity or cowardice of our educational institutions. The honest realization that in a wider sense we are ignorant is a healthy result of the humbling influence of contact with learning; but the knowledge that in so far as an adequate standard of moral values is concerned we have left the classroom empty-handed is neither healthy nor natural. It is symptomatic of the partially diseased condition of college education, and the colleges' laissez-faire attitude toward the problem of morality which is the substance of this disease.

Our educational institutions, for all the joy of their instruction and their generous opportunities for physical and mental growth, have been either unwilling or unable to impart to those enrolled within them a truly moral education. They have given a thorough training in "means" without particularly troubling over "ends." We have absorbed technical knowledge, we are able to quote what Shakespeare said about music and what Schopenhauer said about art, but we have in no wise been given a set of social ideals or behavior norms which we may apply to the external world. In this omission lies the essential failure of the liberal college.

I am inclined to believe that the root of this failure lies in those very basic assumptions which underlie that word "liberal." The liberal undergraduate college as opposed to the large university or vocational school is one which strives neither to make its graduates research specialists nor immediately fit for professional jobs. To know "the best that has been thought and said in the world" and to know it honestly—that is the ideal of the liberal college, an ideal that on first consideration seems noble enough. But upon closer inspection certain doubts arise. To know the best that has been thought and said? All very well. But to what end? Simply to know? And here the observer has come upon the stumbling block in the educational philosophy behind the theory of the liberal college. For surely knowledge for knowledge's sake is as practically absurd as Pater's art for art's sake or Royce's loyalty for loyalty's sake. And knowledge for itself is the distilled essence of the liberal college.

The liberal college has neglected to explore those fields which have to do with the relationship between thought and action. It has set up as its purpose the "to know" without going the necessary additional steps and adding "to know in order to do and do rightly." For the present trend in college education seems to be to divorce belief and conduct, to exalt the theoretical at the expense of the practical. In so doing, our educators have advanced the cause of a narrow scholarship at the expense of society. They have concentrated upon imparting knowledge, and have done so without at the same time developing moral discrimination. They have turned out learned men without turning out good men.

The liberal college has maintained its status as a searcher after pure truth while repudiating its duty of furthering the social ideal. It has guarded well against the great sin of indoctrination, but in so doing has sent out into the world many individuals, bewildered and morally uncertain. For

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it believes that it must be agnostic in its moral attitude, that it must pass lightly by the moral challenges of the day, and concern itself with the "more solid grounds of truth."

There is real reason to believe that this powerful fear of indoctrination which grips the liberal college springs primarily from two sources. The first is the ideal of scientific impersonality which has pervaded all of life since the 19th century, and which has been translated by the liberal college in terms of an unwillingness to pass on moral issues. Proud of its liberality, and fearful of dogmatism and authoritarianism (those hobgoblins of the scientific era) the liberal college feels that it should take no decisive stand upon any subject as tenuous and uncertain as morality. Viewing the moral situation with a timidity caused by the wealth of evidence for many alternative lines of conduct, it hesitates to cast its ballot for any. Thus it sees itself as vindicating the forces of reason against prejudice, of science against dogma.

Theoretically sound, when this attitude is adopted in practice and by the individual members of the liberal college it can only lead to disillusionment, for it is quite impossible to maintain an attitude of moral neutrality in an active world. We are all familiar with the story of the scientifically impersonal donkey who, placed equidistant from two haystacks, was unable to make up his mind and died of starvation on that very spot, perplexed to his expiring breath. Our ability to see many sides of a question without any real enthusiasm leads to the formation of characters critical rather than constructive and therefore to a state of chronic indecision. The liberal college, by its lack of courage in taking a definite stand in matters of moral belief, has upheld a narrowly scientific tradition but has paid the price of indecisiveness on the part of its graduates.

The second cause for the refusal of the liberal college adequately to equip its students with the necessary ethical baggage is that it doesn't know how. And it is not alone in this condition, for there seems to prevail in the world today a general philosophical uncertainty and moral confusion. The imposition of a mechanized, industrial technique upon a pre-machine social order has removed much of the stability of the Victorian age. The coming of the machine has not only changed the mechanics of our ways of living but our moral ideas as well, sweeping away many of the beliefs which were so obviously real and feasible to our ancestors. But we have neither completely abandoned the old nor established the new, and civilization today partakes of both, thus containing much that is outmoded, much that is too novel. As a result there is no established ethical center toward which we may turn for guidance, and what Walter Lippmann terms the "sense of certainty" has disappeared. Sharing in the general bewilderment, the liberal college has been unable to penetrate the moral fog. In such a state it would be worthy of more pity than condemnation if it were not also true that its attitude is not entirely neutral but in some respects leans toward the destructive rather than the constructive side of things. For, faced by this dilemma of the modern world the best that it has been able to do is

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to foster a philosophy of negation, to support heartily the demolition of the old order without making an attempt to build solidly and four-square upon the ruins.

American college education today, then, strongly agnostic in its moral attitude, is sitting on the fence, shy of indoctrination, fearful of being guided by the play of social forces, refusing to give the resolute and positive guidance in the realm of moral action which is its greatest responsibility. The only place where the "thou shalt" or "thou shalt not" gets more than casual and disdainful notice is in our philosophy departments, and anyone who has studied in a class of ethics knows the attempt made to devitalize the essential problems of life and make them musty and pedantic.

In the last analysis, then, the dissatisfaction with college education which is so characteristic of certain recent graduates of the liberal college has a foundation in fact. And if they feel, as many of them do, that in a very real sense they are now no wiser than when first subjected to the influences of the liberal college, it is not because a disillusion with the classroom leads them to believe that frequently it is the place where impossibly big things are solemnly enunciated by impossibly little men, but because they know that in emphasizing knowing, the college has forgotten doing; that while formulating a logic of thought, it has sadly neglected to formulate likewise a logic of conduct. They know that they have not absorbed a concrete and centered ethical outlook from their college environment, and that as an educational institution the liberal college has failed to set before them a practical and workable philosophy of values.

. . .

Protesting "Mr. Flexner's Vineyard"

To the Editor:

May I enter a protest against most, if not all, of the views expressed in The American Scholar by Professor Kemp Malone concerning "Mr. Flexner's Vineyard"?

The nub of this article appears to be that there is a deep-seated antagonism between creative scholarship and the proximity of undergraduates. This postulation is so commonly made by those unfriendly to higher learning that it is painful to find it coming from a friend. So far as the writer is aware no quantitative study of this question has been made. But it is plainly evident that so many exceptions occur that until some tangible evidence is forthcoming such dogmatic assertions are unworthy of the careful scholar. Confining myself to my own field, biology, and omitting the living it is only necessary to recall the names of Agassiz, Francis Balfour, and Linnæus, each of whom attracted scores of students of all kinds, to realize how important many of these "exceptions" are.

It is also true that there are competent makers of new knowledge who are repelled by undergraduates, in fact by any robust social intercourse, and who have little ability to teach. To prove, however, that many "mute

(*Continued on page 508*)

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inglorious Miltons" lie in our universities buried by the dead weight of the undergraduate body is not so easy. One comes to suspect that the significant variable here, as in so many other situations, is the character of the individual man himself. The fact that Phi Beta Kappa is an undergraduate society seems to testify that the desire to know and the will to promote sound learning do not belong exclusively to the graduate student.

Descending to the specific, it is contended that Princeton will provide very stony soil for Mr. Flexner's Vineyard, both because of its remote isolation and its "delightful undergraduate atmosphere." True enough it is not located in a big city but it is midway between New York and Philadelphia and in fact lies at the cross of the "T" extending from Boston to Washington and west past Chicago in which (with the exception of Pacific Coast institutions) most of our important libraries, laboratories, and centers of learning are situated.

In regard to the "atmosphere," the following facts made public last year by Dean Trowbridge may be of interest. The number of National Research Fellows in Mathematics, Physics, and Chemistry who have chosen to work at various institutions is:

76 . . Princeton	42 . . Chicago
64 . . Harvard	31 . . California
59 . . California Institute of Technology	12 . . Johns Hopkins
	12 . . Yale

The distribution of these men in regard to the university where they received their training before being awarded such a fellowship is:

36 . . Chicago	21 . . Johns Hopkins
29 . . Princeton	17 . . Yale
26 . . California	15 . . Wisconsin
25 . . Harvard	14 . . Cornell
22 . . California Institute of Technology	13 . . Michigan

Furthermore, as Professor Malone says, "the really important thing is that Mr. Flexner was able to secure as his professors of mathematics four of the world's greatest authorities in the mathematical field." Two of these men have been working at Princeton for a considerable period of years. An important part of the Rockefeller Institute is also located there. The soil may be stony but evidently it is not too stony for those, whether graduate or undergraduate, who desire to make the "Love of wisdom, the helmsman of life."

GAIRDNER MOMENT.

. . .

Have You a Job for a ΦBK ?

IN the March number we published a letter from a ΦBK alumnus in which he suggested that there must be among ΦBK employers men who would be glad to give an opportunity to other Phi Beta Kappa members who need work and are equipped to do it.

In the last two weeks two young men and two young women, members of the society, have come into the office of The United Chapters, seeking openings.

If you have work to offer, won't you telephone Circle 7-5074, or write to us at 145 West 55th Street, New York, to let us see if we can connect you with the person you are seeking.

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